COAL AGE

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The Answer

Written expressly for Coal Age

By Berton Braley

I've seen it break a woman's heart—

Let's throw it all out on the dump—

I'VE READ a lot in drink's defense
An' I have heard a whole lot more,
But brought right down to common-sense
Them argyments won't never score;
For though the boozers talk an' shout
An' argue through from sun to sun,
They're never able to point out
No **good** that booze has ever done.

"It makes men gay?"—a while maybe,
But then it makes 'em sore an' glum;
There ain't no mirth an' levity
When booze has put you on the bum;
"A little whisky ain't no harm!"
Yes, that's how lots of men begun,
But they can't show, I'll bet a farm,
No **good** that booze has ever done.

An' that's the answer from the start;
I've seen booze make men ravin' mad,
I've seen it break a woman's heart,
I've seen it change good men to bad,
I've seen it fill old friends with hate,
I've seen it make the red blood run,
But never noticed, soon or late,
No **good** that booze has ever done.

Booze sends the miner down the shaft
With tremblin' hands an' bleary eyes;
It makes him careless at his craft
Where carefulness is mighty wise;
It leads to accidents an' death
For Yank an' Dago, Russ an' Hun;
There ain't no guy that's drawin' breath
Can show no **good** that booze has done.

SO THAT'S THE ANSWER, *straight an' plain,*
An' will be till the final trump;
Booze ain't no good to hand or brain!
Let's throw it all out on the dump!

Ideas and Suggestions

Efficiency vs. Making Money

By F. J. Immler*

We hear much these days about efficiency. In fact we hear little else. It's efficiency here and efficiency there and efficiency everywhere we turn. We have used the term so much that it has become to us a sort of bugaboo to dog our steps and to give us an uncomfortable feeling of unrest, a feeling that we are not efficient. The term has gathered such importance that we can hardly think of it but in the sense of meaning a broadening out, a doing of things in a bigger way, a throwing off of the old and putting on of the new. In a word, efficiency is associated with a spirit of change. Living as we do in an advanced age, it is natural to suppose that the ways of 25 or 50 years ago are woefully inefficient and out of date.

But I wish to sound a new note; and as this is also a day of clever paradoxes, pardon me for putting it in that form. I acclaim that the efficient operation of many mines is best afforded by a total lack of efficiency.

I have worked at several mines, have been acquainted with many, and have read about scores in our able (I nearly said efficient) coal papers. Some of these mines were grand successes, some merely made money, and not a few were failures. Some of these mines jogged along serenely with one management, while the same mines under different management became what is only too familiar in mining circles—a losing proposition. As our friend "Postum" says, "There's a reason."

I have always, in my study of the mining industry, concerned myself more with the accounts of the mines that have failed than with those of the mines that have succeeded, and I find that while the failures are generally blamed on the water, top, length of haul, thinning out of seams, watering of stocks and what not, no one ever accused a failed mine or a losing proposition of having been caused by being too efficient—an apparent absurdity. And yet why?

For Some Mines Efficiency Is an Expensive Luxury

Efficiency for many mines is an expensive luxury and suitable for full purses. It is all right and even necessary for a large, complicated organization to coddle the efficiency doctrine, but what about the hundreds of little, struggling mines whose very existence is a crying offense against the god of efficiency?

The laws governing the welfare of companies is much the same as those governing individuals, and while Mr. Much Money may find it very necessary to have a fine, high-powered car to go about town on his business errands, the use of even a Ford is denied Mr. Average Citizen because of the state of his finances. And so with mines. Some mines require large electric "mules," with perfect grades and track, and other uptodate equipment, while others make more money by doing without these things.

*Wind Rock, Tenn.

Of course by having things in good shape and by having the operations well systematized, the superintendent or general manager is relieved of a lot of care and responsibility; for somehow an efficient mine seems to run itself, and no doubt such a mine in the long run will probably well repay for the investment. But the man with his capital tied up cares nothing for efficiency. What he is looking for is dividends—not deferred dividends, but dividends right now; and we must look out for him before adopting our efficiency principles to see that he is no worse off by the change.

I know of several mines which would today be much better off if they had left efficiency strictly alone. With their new fine haulage system, complicated tipples and up-to-the-minute machinery they are today making less money, or no more, on a larger investment than in the days when they were apparently on their last legs and the morrow's run a seeming impossibility. Yet with the latter conditions the cost sheet showed up well and the man with the "scads" in the venture had no cause for complaint.

Of what avail is it to have the haulways laid with heavy rails, with perfect grades, true alignment of track and subserved with large, expensive locomotives, when with lighter steel, the natural grades of the seam, indifferent alignment and smaller locomotives, you could still get the output? Your efficiency man says "power saving," but that is a long, bitter grind, and a thousand and one things can happen to frustrate the accomplishment of this saving.

I have seen and no doubt you have also seen the thing tried under different settings. You have noted that while the whole tenor of the management was for efficiency, the cost sheet showed a decided slump, and perhaps you have wondered with the directors the cause thereof. And perhaps you have seen the mine abandoned because the directors decided that if they could not make the mine pay with an efficient management it would not pay with any. But you never heard it mentioned that this very efficiency was the sole cause of the downfall. In this case and in many cases the management loses sight of the cost sheet.

Cost Sheet vs. Model Mine

The cost sheet should be the bullseye at which every manager should aim and not the having of a so-called model mine. The textbooks and the efficiency men do not agree with me that a model mine and the cost sheet do not always walk hand in hand, but then they do not cover every individual case.

An operator in one district, prominent by his successes, was asked how he managed to make so much money out of his mine. His answer was unintelligible to his questioner, but it covers my point exactly. He merely replied, "That is what I am in business for." In other words, he aimed at the cost sheet. I visited his mine once and was impressed by the number of apparent makeshifts he

had about his plant, but as they did their work well, they were, in contradiction to their looks, highly efficient.

There is always some best way of doing a certain thing or accomplishing a certain end. There is always some best way in operating a mine. But in seeking this way let us not lose sight of the fact that we must be governed by cheapness of cost. Let us not seek the way which is easier or methods which are more familiar, with ourselves, but let us adapt ourselves to the circumstances and equipment at hand and be extremely wary in discarding the system or lack of system of our predecessors in management.

However, and as perhaps you would infer from my article, I would not have all mines run on a loose-jointed, haphazard basis, but I do advise to make haste slowly in discarding the old and putting on the new.

The whole matter is linked closely with our idea of efficiency. If you consider efficiency in the sense of having a model mine, a fine looking camp and a group of smiling workmen, you will probably come to grief, for such conditions are well-nigh impossible outside of paradise or the optimist's dreams. But if you consider efficiency in the measure of paying from the start adequate dividends for the capital invested, or in other words as the having of a nice row of black figures on the bottom line of your cost sheet, you will no doubt become an individual of that rare species, "a successful mining man."

May there be many such!

Effective Discipline

By Forney L. Parker*

In any organization it should not be every man for himself, but there should be a common and universal plan for progress. Organization to be efficient must have effective discipline; without it the whole structure is swept by internal dissensions which will soon tend to disrupt it.

The reason the American army officer or American naval officer is so efficient is due to the rigid entrance examinations which must be passed to enter the institutions at West Point and Annapolis, and the later strict discipline during the course of instruction.

Without discipline on the part of the crew and passengers, there would be many more fatalities on board a ship during a disaster at sea than there are ordinarily. Without discipline in a home the members of the family would not be united in a common ideal. Just as the orderliness of school children when the schoolhouse is afire depends upon the school discipline which was imparted to them by the teachers, so also the conduct of the men in times of mine disasters depends upon the discipline imparted to them by their superior officers.

The boss must be consistent in his discipline and apply it to himself as well as to his subordinates. His men should abide by his decisions and obey orders, and there should be a definite and clearly defined penalty for any act of disobedience.

To be effective, discipline should be impartial and general, and the men should gradually be brought to have the right attitude to the rules of the game. With this in mind, no matter how threatening the danger may appear, the men will follow their leader without question.

*Joliet, Penn.

Back of each inflicting of punishment there should be an accurate knowledge of the case, and when the penalty is inflicted, be sure that the miner knows exactly for what he is being punished.

It is oftentimes better to demote an employee as a means of punishing him than to discharge him, for if he sees the error of his ways and determines to start anew, he will do better for the mistakes he has committed.

If you standardize your conditions and make the mine a desirable place in which to work and carefully select your men and give them high ideals, discipline will be made easy and effective.

The Religion of Safety

Down in Birmingham, Ala., a high type of tribute was recently paid to the value of safety work.

Dr. Henry M. Edmonds, pastor of the Independent Presbyterian Church, which counts in its membership scores of the leading business men and industrial captains of that district, recently preached a Sunday night sermon in one of the downtown theaters on the subject of "The Lame Man," his theme being the work of lessening the number of lame men and to care for those already lamed. Dr. Edmonds said to the thousand persons in his audience:

"Men, be careful; say for this year, I'll do all I can to live it through and get all I can out of it for myself and my family by being careful. Tell your fellow workman to be careful—we want no more lame men. They make us think of all a man might have been except for carelessness.

"You men (and I see lots of you here tonight) who are the captains and leaders of other men; make it your business for 1916 to make your plant a safe place. See that all the loose bolts are tightened and all dangerous places guarded. Say to yourselves, 'As far as I can go with the brains and means at my disposal, I'll make it hard for men to be lamed in my plant during 1916.'"

There were coal miners and coal operators in Dr. Edmond's audience. They were there because a religion that is so practical as to have as a part of its ministry sermons on safety, appeals to such men.

What better religion of the practical kind can coal-mining people want for 1916 than the kind that teaches that the great God of our universe does not want lame men, but strong and vigorous ones? Also that those who are found lame must be cared for even as Christ so many times touched and healed them.

The religion of safety! Won't mining men of all classes resolve to make it their religion of practice? Let's make 1916 the year of least accidents from individual carelessness and of none from a general disregard of safety first. Let's take off our hats to any and every man who during this year not only preaches but practices daily the religion of safety. Nail this moto on the wall above your desk: "Fewer Lame Men in 1916."

By the Way

After the acting, wishing is in vain.

Is it wise to burn up a candle in searching for a pin?

Fortune may make friends, but it takes misfortune to try them.

Something we are going to learn next month won't help us in our work today.

Envy is a type of awkward homage that inferiority pays to merit and ability.

Shaker Screen Drive

By William H. McGann*

SYNOPSIS—This article discusses the most efficient means of supporting and driving shaking screens. The least power is required where the hangers are made of such a length that the shaker oscillates approximately as a pendulum.

Driving a shaker screen consists primarily in obtaining rectilinear motion from a revolving shaft. This may be accomplished by either eccentrics or cranks, with connecting rods attached to the screen.

With a screen supported on rollers having the roller races horizontal and the driving shaft set at the same elevation as the attachment of the connecting-rod to the screen, a practically true harmonic motion is obtained.

The eccentric is not an ideal method for driving a screen, because screen movement requires a large shaft to withstand the stresses due to the drive. Consequently eccentrics cannot be less than about 13 in. in diameter, with straps about 17 in. in diameter. This large unbalanced mass of metal must have about 100 r.p.m. to drive the screens, and it induces unnecessary bending stresses in the shaft. In order to have the strap wear uniformly it must be made with a large cross-section so as not to distort, but is then difficult to run without heating. Twice in each revolution of the eccentric shaft the shaker screen is brought to full speed and stopped. To handle the large stress due to starting and stopping the screen the eccentric strap must be heavy or the designer must resort to springs at the screen end of the connecting-rod so as to reduce the impact stress on the strap.

Although the total stress in either direction on eccentric strap and eccentric and on the crank pin and connecting-rod head will be equal, since the eccentric is at least four times the diameter of the crank pin, it requires four times the amount of power to overcome friction. Furthermore because of the large surfaces in contact between the eccentric and eccentric strap these are difficult to keep sufficiently lubricated.

The disk or side crank is satisfactory for shaker-screen drive, but is limited to driving but one screen, unless the designer resorts to a bell crank. This should be avoided on account of the unnecessary connecting-rods, the heads of which require frequent adjustment in order to avoid pounding.

The crank drive is ideal because of the relatively small diameter of the crank pin; brasses are simple and exact adjustment can be secured so as to take up the wear of the moving parts. The crank pin and crank arms are designed to take the full stress caused by starting and stopping the screen; the resulting sizes are not excessive

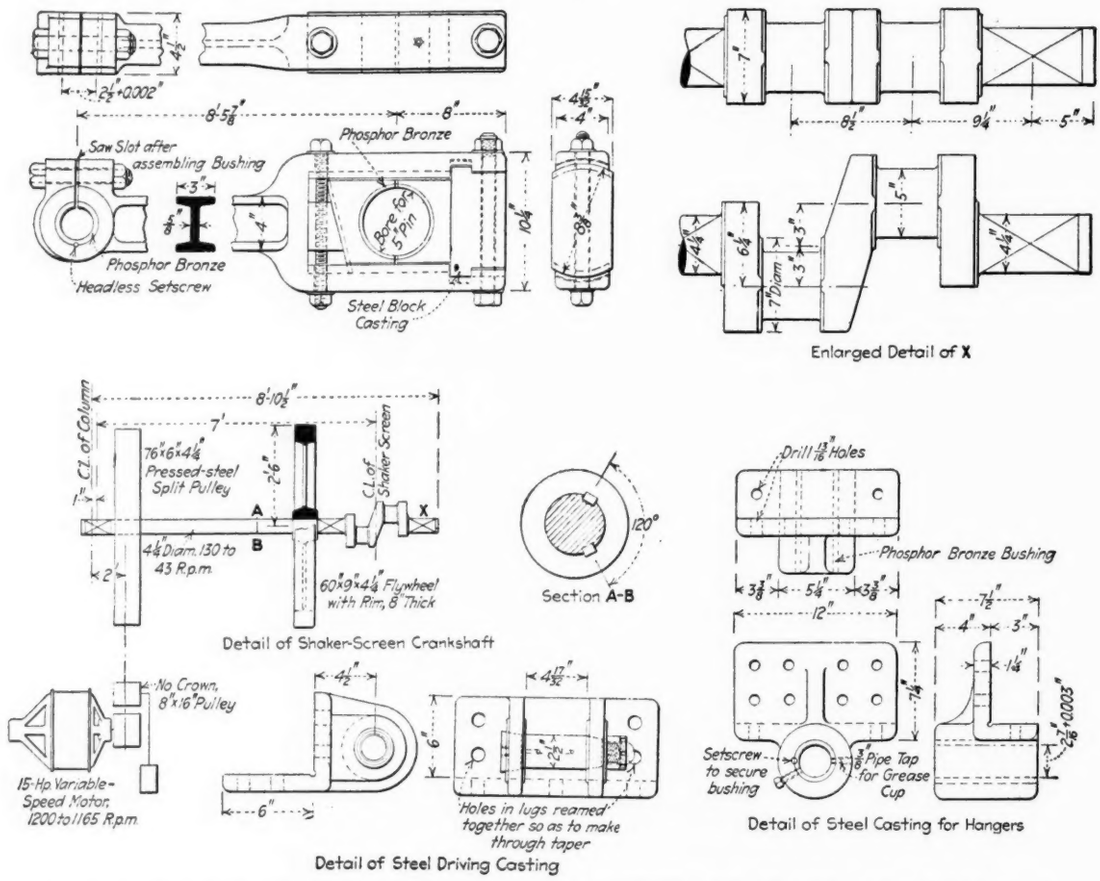

Saw Slot after assembling Bushing
Phosphor Bronze
Headless Setscrew
Phosphor Bronze
Steel Block Casting
Bore for 5" Pin
Enlarged Detail of X
Detail of Shaker-Screen Crankshaft
Section A-B
Drill 13/16" Holes
Phosphor Bronze Bushing
Setscrew to secure bushing
3/8" Pipe Tap for Grease Cup
Detail of Steel Casting for Hangers
No Crown, 8"x16" Pulley
15-Hp. Variable-Speed Motor, 1200 to 1165 R.p.m.
Holes in lugs reamed together so as to make through taper
Detail of Steel Driving Casting

FIG. 1. DETAILS OF A SHAKER SCREEN DRIVE, ALSO OF THE DRIVE AND HANGER CASTINGS

*Chicago, Ill.

and the use of springs on the screen end of the connecting-rod is entirely unnecessary. Fig. 1 shows a detail drawing of a crank for shaker screens.

In a screen drive using two connecting-rods (with springs for cushioning the shock of driving the screen) the ideal condition of each driving rod carrying an equal share of the stress cannot be realized because of the unequal deflection of the springs. This inequality causes one rod to become shorter than the other and sets up a turning movement in the screen, which in a roller-supported screen has to be taken care of by the flanges of the rollers bearing on the races.

Fig. 1 also shows the crank and screen end of the connecting-rod. Care must be exercised in the composition of the brass in the connecting-rod head, as a hard, brittle brass seems to break up and scour out, causing the bearing to heat.

It will be noted from Fig. 1 that the cross-section of the connecting-rod is of the H-type. This type has passed through all the stages of experimentation. The first rods were built up from structural sections and were found far superior to those made of pipe.

While on the subject of connecting-rods a word or two ought to be said of those rods made of wood. These are economical and efficient when they are used to drive light screens, but great care must be taken in securing the screen and crank ends. Fig. 2 shows a good design for the crank end of this type of rod. Wooden rods are made of ash or maple and are usually about 4x6 in. in cross-section. A portion near the screen is cut down about 2 in. on each side so that the resulting section is 4x2 in.

One of the most difficult problems met with in any ordinary screen drive is that of making each connecting-rod do its share of the work. In the design of a double connecting-rod drive it is necessary to make the screen end of the rod with some means of adjustment so as to take care of about ½ in. total difference in the lengths of the two rods. Fig. 3 shows one good way of accomplishing this result.

A single connecting-rod driving each screen is the best type of drive for a shaker from both an engineering and operating standpoint. The single drive eliminates the one big objectionable feature of double rod drive—namely, the unavoidable adjustment in the rods; and retains all the good points of the double rod drive. With the single rod drive there are half the number of cranks and rods, half the repair parts to keep in stock, half the wear and tear on the machinery. The only possible objection to the single rod drive is the small amount of side thrust due to the eccentricity of the center of gravity of the screen with respect to the line of thrust of the rod. This, however, is easily taken care of by designing the links therefor.

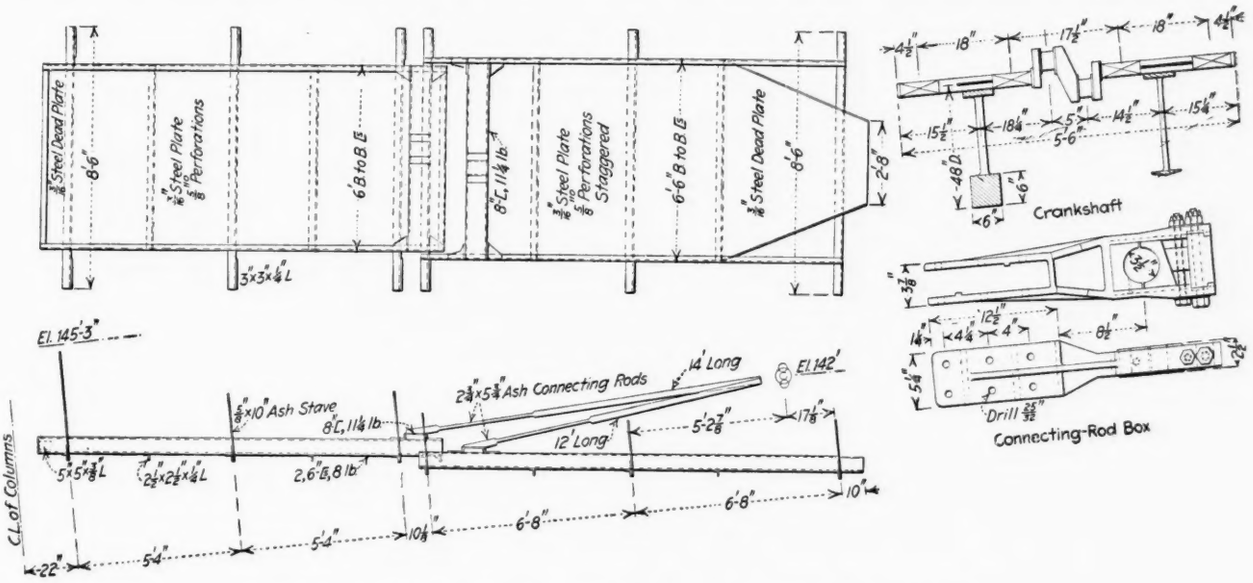


FIG. 2. A GOOD DRIVE FOR TWO SCREENS, WITH SOME DETAILS

One of the most important points to be considered in drives for shakers is the manner of supporting the screen. This may be divided into three classes—roller, hinged and flexible hangers.

Three Types of Roller Supports

There are three different arrangements for supporting a screen on rollers. One method used by numerous screen manufacturers is composed of a roller, usually double flanged or grooved, to prevent side motion, and two roller races, the lower race being secured to the building structure and the upper race to the screen.

While this is an excellent design from a theoretical viewpoint, the screen being supported on a roller bearing with no friction except that due to a wheel rolling freely on a hard, level surface, it is unsatisfactory in operation, because there is always a large amount of coal dust in the air. This dust settles on the lower roller races, increasing the rolling friction. With a screen supported on three sets of rollers sufficient coal has been known to collect on one set of races to raise the screen off one of the other sets of supports, causing the idle set to creep either on the forward or return stroke until it drops off the lower race. In an effort to prevent trouble from this creeping, the ends of the races are turned toward the roller at a radius equal to its radius.

With roller races of this type (Fig. 4) and rollers in pairs keyed to the ends of a shaft, any difference in the roller diameters will cause friction, and unless they are finished to the same size they will absorb considerable power.

Another type of roller support consists of a single flanged chilled or finished roller mounted either on a gudgeon or on a through shaft. When mounted on the shaft, the roller may either be keyed to it or be bushed and allowed to run loose. The roller is supported on a steel track or race. This type has the same defects as the first so far as collecting dust and absorbing power are concerned, but there is no danger of the roller creeping off the race. It is difficult to keep this kind of roller lubricated.

A third type of roller support has all of the good points of the other two and none of their defects. It is composed of a roller race fastened to the screen and a chilled tread flanged roller mounted on a through shaft, each end of which is supported in bearings and secured to the structure. This design is illustrated in Fig. 3.

It is obvious that in a roller bearing of this type, having the bearings supported rigidly and each one free to turn, no coal dust can lodge between the race and the roller. Furthermore, the bearings for each roller are easily accessible for lubrication. A modification of this type may be made by flanging the track. In using the second and third type of rollers, the power absorbed by friction in these members (assuming the same size of shaft) varies inversely as the roller diameters; that is, an 8-in. roller would absorb twice the power of a 16-in. roller and a 12-in. roller would use two-thirds of the power of the 8-in. roller.

There are two types of hanger supports—the hinged and the flexible. The flexible hangers are secured rigidly to the screen and to the support, so that the movement of the screen will bend the hanger an equal amount each side of

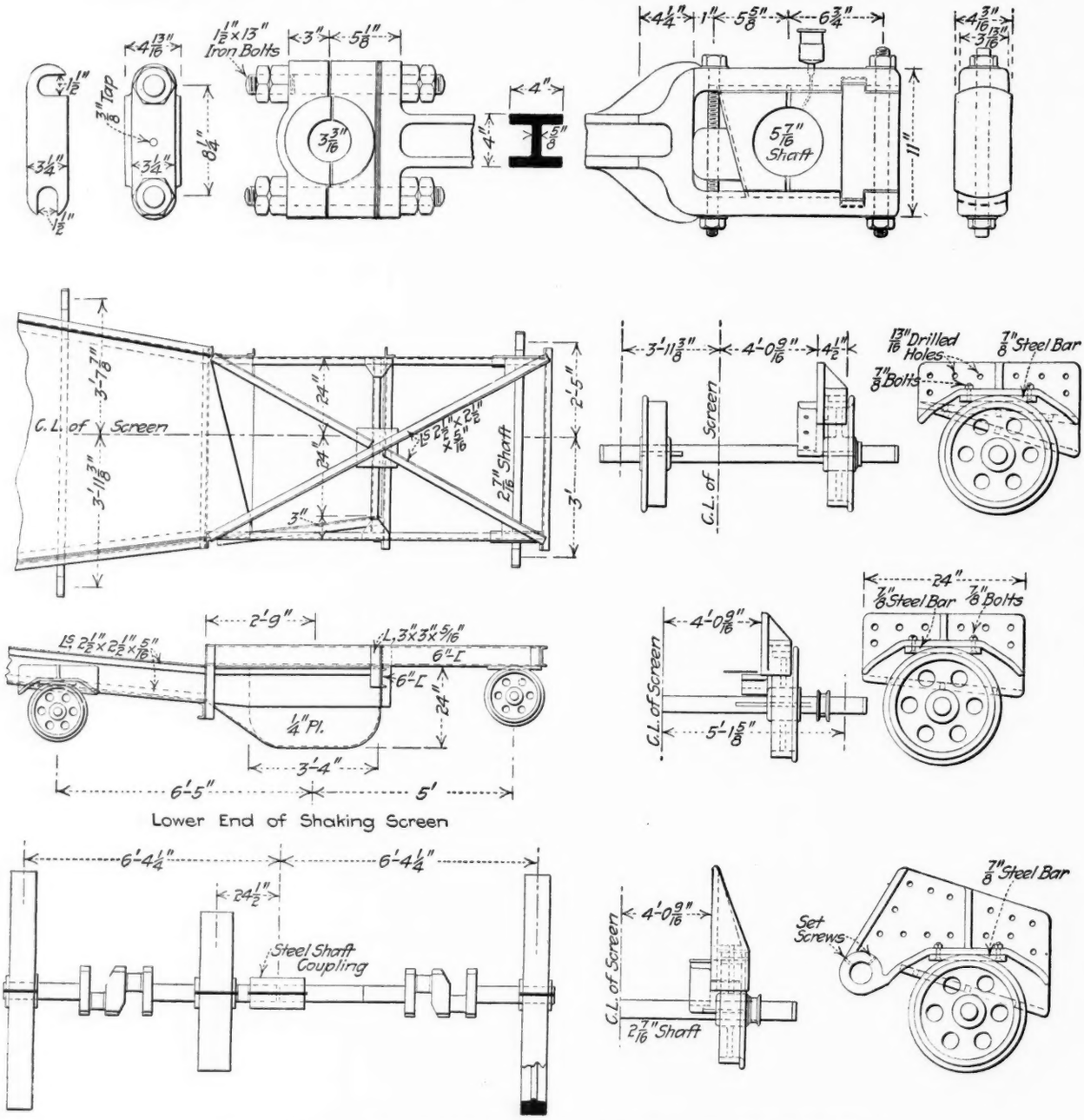


FIG. 3. MEANS FOR SUPPORTING AND DRIVING A SHAKING SCREEN

There are two types of hanger supports—the hinged and the flexible. The flexible hangers are secured rigidly to the screen and to the support, so that the movement of the screen will bend the hanger an equal amount each side of

its normal or vertical position. Flexible hangers may be of steel or wood, but the steel hangers have not proved very successful owing to the steel crystallizing at the points of the greatest bending. Wood hangers are made of true, well-seasoned and specially selected hickory or ash, 10 or 12 in. wide and varying from ⅝ to 1 in. in thickness, depending on the length—the shorter the hanger the thinner must be the support in order to secure the necessary flexibility.

Screens May Be Either Supported or Suspended

With hangers made of wood the screen may be hung from above, in which case the hanger is under tension, or the supports may be placed below the screen, thus acting in compression as struts. Practical experience places the minimum length of wood hangers at 5 ft. and the maximum about 8 to 10 ft. The supports may or may not be placed parallel to the screen, the essential feature being to maintain all the hangers equal in length or to have them shorter from one end of the screen to the other by an amount in proportion to the distance each hanger is from the end of the screen. Fig. 2 shows a method of attachment to the screen.

A light design of the hinged type of hanger may be used for a medium-weight screen. This type of support, with extra large bronze bushings at the screen end and babbitted boxes at the stationary end of the hanger, both provided with large grease cups, cannot be otherwise than efficient. The wear is negligible, dust does not interfere in any way, and the minimum distance between the screens, when one is placed above the other, may be secured. Such an arrangement is often highly desirable.

Another form of the hinged hanger type of screen support is a modification of the foregoing and consists in shortening the link until its length corresponds to a pendulum whose theoretical rapidity of vibration is not quite as great as the rapidity of oscillation of the screen. This type of support, when provided with roller bearings at the hinge points, absorbs a remarkably small amount of power in operation when driven at a proper speed.

The following tables and formulas are used in design of screens supported by hinged type hangers:

W = Weight of reciprocating parts, including coal (assumed to be 4 to 6 in. deep on all screen surfaces);
R = Revolutions per minute;
S = Stroke in feet equal to the throw of the crank;

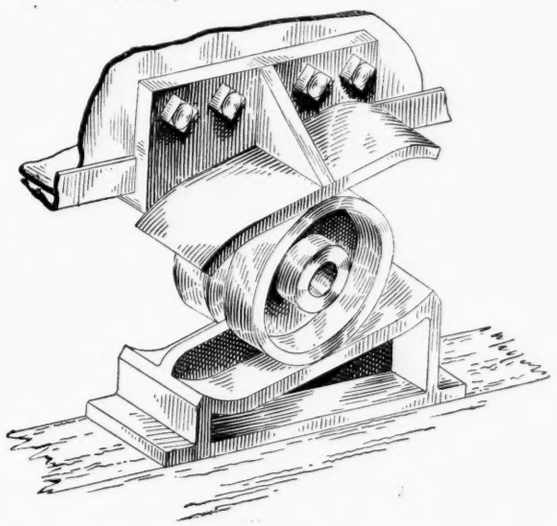


FIG. 4. A COMMON FORM OF ROLLER SUPPORT FOR SCREENS

Ww = Weight of rim of the flywheel;
Rw = Radius (in feet) of the flywheel rim;
M = Bending moment in inch-pounds;
T = Torsional moment in inch-pounds;
P = Pressure in pounds per square inch;
V = Lineal velocity of surfaces;
d = Diameter of shaft in inches.

The average force on the connecting-rod driving a screen is

$$Fa = 0.00011WR^2S \qquad (1)$$

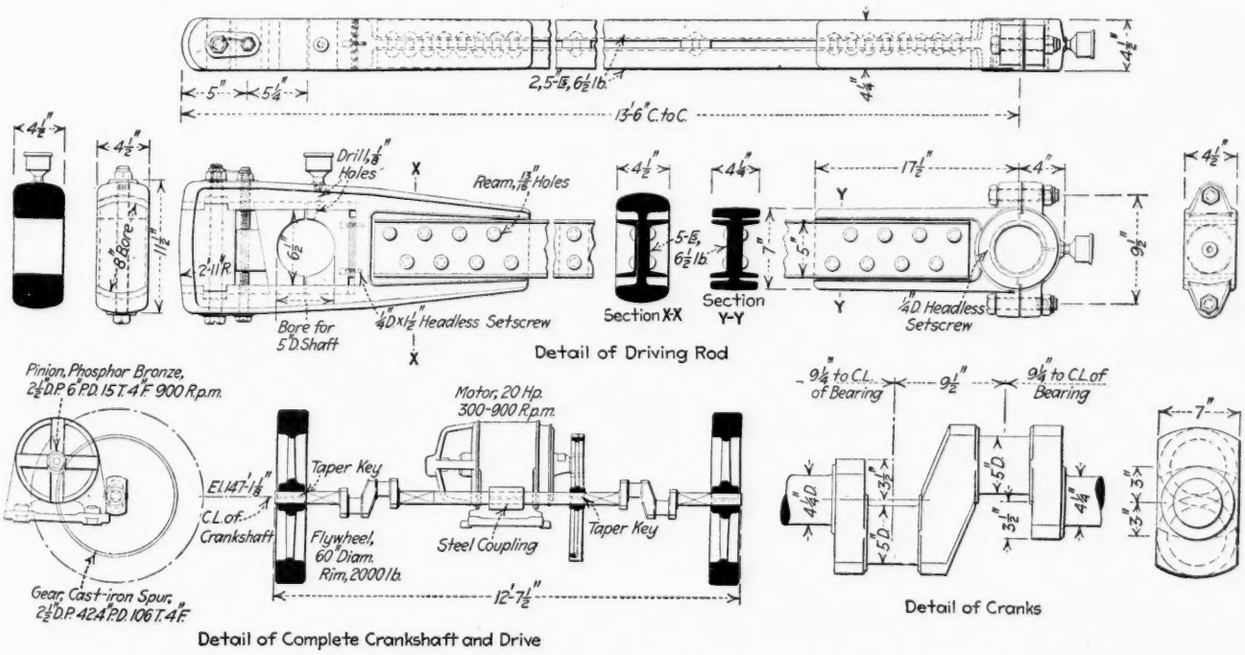

2,5"-B, 6½ lb.
13'-6" C. to C.
Drill 1⅛" Holes
Ream, 1⅜" Holes
Bore for 5" D. Shaft
4"D x ½" Headless Setscrew
Section X-X
Section Y-Y
4"D Headless Setscrew
Detail of Driving Rod
Pinion, Phosphor Bronze, 2½ D.P. 6 P.D. 15 T. 4 F. 900 R.p.m.
Motor, 20 Hp. 300-900 R.p.m.
Taper Key
Flywheel, 60" Diam. Rim, 2000 lb.
Steel Coupling
Gear, Cast-iron Spur, 2½ D.P. 42.4 P.D. 106 T. 4 F.
12'-7½"
Detail of Complete Crankshaft and Drive
9¼" to C.L. of Bearing
9½"
Detail of Cranks

FIG. 5. DETAILS OF CRANK SHAFT AND BUILT-UP DRIVING ROD

The maximum force on the connecting-rod driving a screen is

$$F_m = 0.00017\,WR^2S \qquad (2)$$

The horsepower consumed in driving a hanger-supported screen is

$$Hp. = 0.00000000112 \times WR^3S^2 \qquad (3)$$

The proper size of flywheel, based on weight of the rim and radius of the wheel, is

$$WW \times RW^2 = 2.65\,W'S^2 \qquad (4)$$

For designing the crankshaft for shaker-screen drive the following formula is used to obtain the diameter of the shaft:

$$d = 1.72\sqrt[3]{M + \sqrt{\frac{M^2 + T^2}{16{,}000}}} \qquad (5)$$

The usual source of power for driving screens is either a steam engine or an electric motor. When an engine is used, it is usually placed on a foundation beneath the shaker structure and belted to the driving shaft. When an electric motor is employed the screen shaft is either belted or geared to it. When gears are used with a motor of less than 750 r.p.m. and using a cut bronze pinion and a cut cast-iron spur gear, an efficient drive is secured.

Another form of motor drive is the one similar to the steam-engine drive, and a modification of the belted motor drive shown in lower left-hand corner of Fig. 1, which develops lower repair costs and a cheaper installation owing to the fact that a higher-speed motor was used with a comparatively low cost of pulleys over cut gears. In the drive shown a 15-hp. motor is attached to a shaker screen through a 4-in. double leather belt. A 13-day test showed an average hourly power consumption of 3.6 kw.-hr., including picking table and degradation conveyor motors.

An electric motor drive is superior to an engine for operating a shaker from a practical and economical point of view, in that the screens are always under control of the dock boss, weighman or whoever is in charge. Furthermore, when there is no coal on the screens, the motor is slowed down until the shaker shaft is only making 4 to 6 r.p.m., thus saving considerable power in a day's run.

Extracts from a Superintendent's Diary

Today my wife overheard a spirited argument between our cook and our cook's cousin, a daughter of the president of our miners' local, the effect of which upon my wife has been most satisfactory from my point of view. Every time my wife goes to the city to attend a meeting of her club she returns home filled with doubts and misgivings as to the justice of the authority that I assert over the men under me. In her club are several social settlement workers who expound socialism at every opportunity, and to their minds, according to the reports that my wife brings back, coal barons and their flunkies (coal mine superintendents, etc.) are only tolerated because the great majority of human beings either haven't been educated to realize their rights or are too timid to assert them.

The opinions of the cook's cousin seem to agree rather closely with the views held by the social settlement workers of my wife's club, judging by the account of today's clash, as related to me by my wife; but fortunately our cook got the better of the argument and made a decided impression upon my wife; and the next time the ladies in town make insinuations particularly aimed at my wife, it is more than possible that fur will fly.

The cousin came to the gate early this morning to get our cook to join her in a trip to town, but learned that the cook could not go. This seemed to anger her, and she proceeded to tell the cook that anyone with a speck of pride wouldn't be willing to work five minutes for a flunky of the despised capitalist class anyway.

Our cook accepted the challenge, and the battle began. The daughter of the miners' president had heard socialism and all of the other "isms" discussed so often at home that she was well up on all of the arguments, and for a few moments it looked as if our defender would have to retire in disgrace; but she happened to recall a few events of current history that seemed to give the lie to some of her cousin's theories, and that put her cousin on the defensive, and on the defensive she remained.

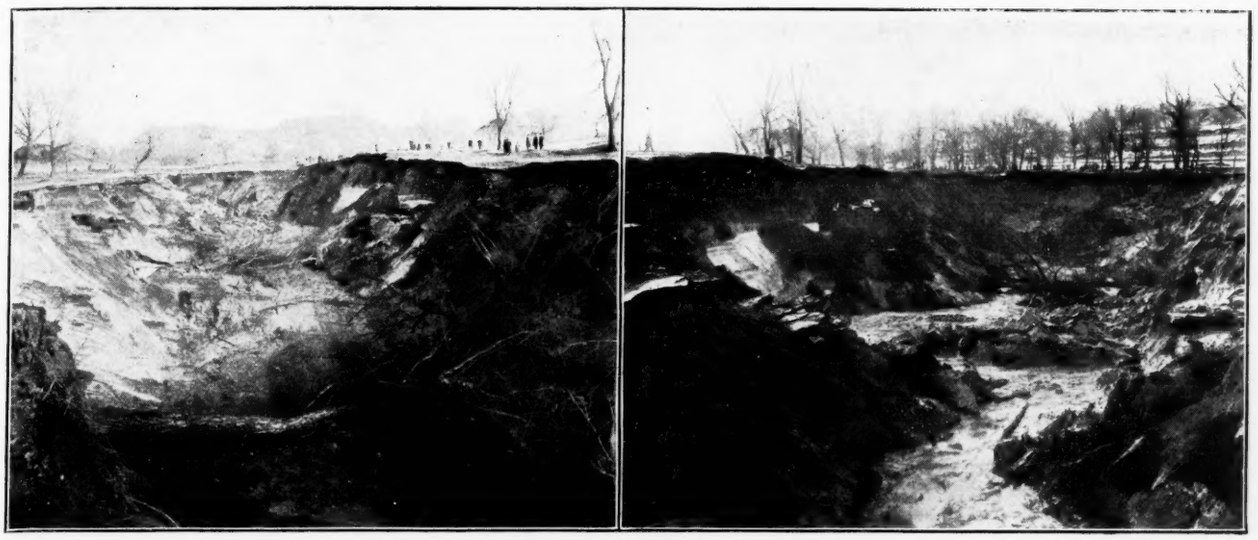
My wife learned while following the argument that our cook's uncle never made a living for his family except when he lived in camps where the management insisted that all of their employees must work regularly. Clearly an "every man for himself" state of society would not hold out much promise for that man's family. And then my wife learned that most of the miners in our camp believe that our mine worked full time all through the past summer, in spite of the general depression, largely because their superintendent knew his business better than did the superintendents of neighboring mines.

In the final analysis they were willing to admit that managers and superintendents were rather important individuals after all. My wife also learned of a colliery owned outright by a man once considered wealthy who has been reduced almost to bankruptcy largely because the men were allowed too many privileges. Not only is the owner in a bad way, but his laborers also. Our cook having formerly lived in that camp and having a father still living there, described it in a way that left little for the imagination.

After the excitement had subsided, Mrs. Thompson went into the kitchen and unconsciously issued a few orders in a rather brusque manner. The cook was in arms instantly. She offered her resignation and only reconsidered the matter after much urging. I suggested to my wife that she should have accepted the resignation and offered the job to our cook's cousin. She does not know yet whether I was in earnest or only joking.

Of the World's Production of Coal, the United States consumes nearly 40 per cent., but despite this we have as yet used only one-half of 1 per cent. of the total quantity that is present in the United States.

Lighting Blasting Fuse—The United States Bureau of Mines has recommended a new scheme to replace splitting the end of the fuse and touching off with a lighted match. The scheme has been devised by W. C. Cope, of the bureau, and is of service only where single pieces of fuse are used. A safety match is held against the powder core at the end of the fuse and the matchbox drawn across the match, causing the match and powder core to inflame immediately. It will be noted that this is just the reverse of the usual way of lighting a match—drawing the match across the box. In case safety matches are not at hand, the ordinary household match can be used by placing one match against the powder core and then lighting another and quickly touching it to the first one.



FIGS. 1 AND 2. TWO VIEWS OF THE MINE CAVE

Cave at the Prospect Colliery

By C. M. Young*

SYNOPSIS—Because of what is believed to have been a pothole the roof rock of a mine supposedly 40 to 50 ft. thick was only about 10 ft. thick. This roof caved directly under the bed of a stream, allowing much loose material to be washed into the mine. Some of the débris may be allowed to remain, but all the water will have to be pumped out.

Mill Creek is ordinarily an almost insignificant stream, but when heavy snows are followed by warm rains, it sometimes becomes 30 to 40 ft. in width and 3 ft. or more deep. At the height of a recent flood of this kind, the bottom of the stream dropped out and the whole current was turned into a mine. This unusual and alarming cave-in occurred at the Prospect colliery of the Lehigh Valley Coal Co., near Wilkes-Barre.

The coal beds nearest the surface at this point are the Abbot, the Bowkley and the Hillman. These dip at from 6 to 8 per cent. near the outcrop, although dips of 25 per cent. are found in some parts of the mine. The Abbot coal bed outcrops south of the stream, which does not pass over this measure at the point of the break. The other two beds underlie the stream. In all, seven coal beds are worked at Prospect, but the deeper measures are not connected with those nearer the surface, so that the trouble was confined largely, if not entirely, to the Bowkley and Hillman coal measures.

In the Bowkley bed all the solid coal had been removed from the immediate neighborhood of the cave, except a barrier pillar. No work was being done at this point when the break occurred. There was no reason whatever to expect trouble, as about 40 ft. of rock overlies the coal at this part of the mine. A borehole, approximately 300 ft. from the break, on the line of the strike through it, had showed about 40 ft., and there was no reason to doubt the comparative uniformity of this thickness of cover.

*Scranton, Penn.

The first break occurred on Dec. 12. At this time a hole about 10 ft. in diameter in the rock and directly under the creek bed allowed a large amount of surface soil and a considerable volume of water to enter the mine. It was found that the rock at this point was only about 10 ft. thick, while there was from 40 to 50 ft. of loose surface soil instead of the usual thickness of approximately 10 ft.

Another Colliery Was Affected

Apparently the water which entered the break found its way, at least in part, to the Delaware & Hudson colliery to the east of the Prospect, for this company threw a dam across the stream, directing it into an old channel which passed around the break, although close to it. The Lehigh Valley Coal Co. tried plugging the hole by putting in planks side by side inclined with the bed and in the direction in which posts would be set in a dipping measure. Against these, bushes, hay and soil were placed, and the inflow of water was largely stopped.

A second break occurred after a heavy fall of snow which was followed by warm rain. The commonly unimportant stream was then swollen until it carried a current about 35 ft. wide and 3 ft. deep. The dam previously mentioned failed, and the hole formed by the first cave was quickly filled. The pressure produced was too much for the edges of the plugged hole, which caved sufficiently to allow the water to enter and sweep away the plug. The whole body of water which had collected, together with the softened sides of the hole, went into the mine. It is roughly estimated that 70,000 cu.yd. of earth entered the workings, mostly in the two hours following the break. The entire volume of the stream continued to enter the cave until it was controlled by dams.

While no accurate measurements were made, it is estimated that the current amounted to 30,000 to 40,000 gal. per min., and that in all something like 90,000,000 gal. of water flowed into the mine. This material has only been partly accounted for, but it must be in the

mine, as there is no natural drainage, and the water will have to be pumped out. It is possible that the mud can be allowed to remain where it is. If so, this is certainly the most rapid bit of slushing on record.

Four Dams Were Built

The flow of the stream was finally controlled by four dams built successively as they were needed. Sheet piling, made of planks, was used largely, this being supported by rocks, timber and sandbags. The second dam was extended for some distance along the stream to prevent seepage as far as possible. It was found difficult to make these dams tight because of the soft nature of the soil. No clay was available until some was discovered near the bottom of the cave.

In order to get the stream past the hole, a new channel was excavated, this being protected by sheet piling. A part of this channel is shown in Fig. 5. One of the dams built failed temporarily, and a considerable amount of water found its way into the end of the cave hole.

The soil over which the stream flowed after the change of channels was effected is soft, and it was feared that the water would be able to penetrate it and find another point of access to the hole. It was impossible to throw the stream farther to the north because of a railroad embankment, and it was planned to excavate a channel on the south side of the cave, using a steam shovel for the work.

Plans for the prosecution of the work were upset by another change of weather. With a good covering of snow on the ground a rain commenced on Christmas Day. The stream rose rapidly in the night, and at 2 o'clock on the morning of Dec. 26, which was Sunday, it overflowed the dams and also overflowed the bank at the point marked *C*, Fig. 5. If the dams had given way entirely it would probably have been better, for then the water would have flowed through the part of the cave already existing and there would have been only a small amount of loose earth for it to wash away.

The water overflowing at *C* immediately found a way to the cave and washed in a large amount of earth, leaving a hole whose surface outline is roughly indicated on the sketch. The amount of earth displaced at this time was about equal to that which had previously been washed in, so that on the whole about 140,000 cu.yd. of earth was washed into the mine.

Work was commenced as soon as possible on the digging of a new channel on the south side of the cave. A large force of men was employed and work was pushed night and day, but 100 hr. was needed to finish the ditch. It was not possible to start work on the ditch as soon as the break was discovered, and for 110 hr. water was flowing into the mine at the rate of over 40,000 gal. per min. The total amount which entered the mine after this last break was about 250,000,000 gal., so that in all about 350,000,000 gal. of water has entered the mine. The ditch which was dug is 5 ft. wide, 6 ft. deep and about 1,500 ft. long. It is lined with 2-in. plank. As the mine is not self-draining all of the water entering it will have to be pumped out. Fortunately it is all confined to the upper beds, and the operation of the lower beds can be continued.

A dam was built across the channel a little below the entrance of the ditch, and a second ditch is being dug parallel to the one described and a little below it. The dam is temporary and serves only to keep water out of the last ditch while it is being dug. A steam shovel is being used to do part of the work. This ditch will have sloping sides and will be 9 ft. wide at the bottom and 15 ft. at the top. Like the other it will be lined with 2-in. plank. These two channels will give plenty of room for the water, and a dam to be constructed across the old channel will effectually shut the water out of the cave.

FIGS. 3 AND 4. BUILDING A DAM AND DITCH TO PREVENT THE STREAM FROM REACHING THE CAVED AREA

The break in the rock has been filled with trees, old rope and large rocks. A layer of coarse rock is to be placed over this, and on top of this a layer of finer rock. Then tough clay will be put on as a top dressing and the cave filled up with silt.

This occurrence has been both alarming and costly. Fortunately no lives were lost. It was something which could not have been foreseen, because the area of thin rock is apparently small and it would not have been found by drilling, unless by the merest chance a hole had been located at just the right point. In fact, drilling had showed perfectly safe conditions. There would have been no cave had not the stream crossed this weak point.

It is believed, and the belief seems to be correct, that a pothole was the cause of the original break. Observers of the hole as it at first appeared report that it had the rounded sides found in potholes. These holes are not really common here, but they are sometimes found, and many are doubtless concealed by the layer of glacial drift which covers the surface in some of the valleys. Apparently this pothole was in the bottom of a preglacial valley which had been filled with drift. The presence of such a valley is suggested by the large amount of loose earth

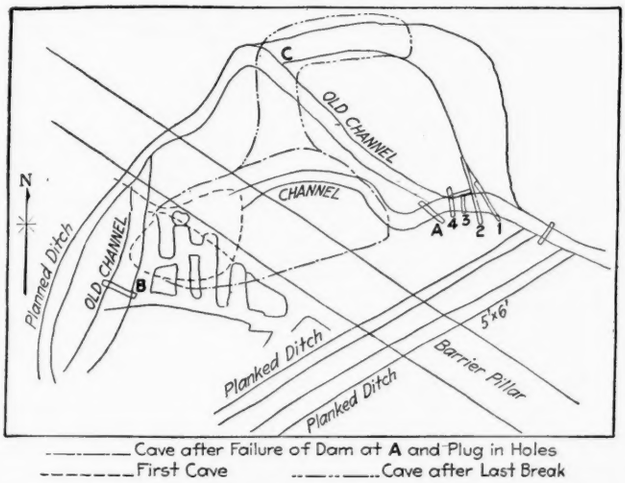


FIG. 5. SKETCH SHOWING EXTENT OF MINE CAVE

and by the character of the material, which was a mixture of sand, gravel and clay. Also some water-worn rock was exposed on the sides of the cave.

This is an unusually forcible illustration of the hazards attendant upon anthracite mining. The Wyoming district, in which the cave occurred, is comparatively free from complications, and its engineering problems are, in general, less difficult of solution than those of the other districts. In this case the operation of a mine had to be suspended, about 2,000 people were thrown out of work, and a large expense was incurred, all because of an accident which could not be anticipated. This shows plainly that anthracite mining is an industry which suffers much more from accidents due to the nature of the country than does bituminous mining as practiced in most of our eastern states.

Compensation Act in Wyoming

Subject to employment contracts entered into before April 1, 1915, mine operators in Wyoming are compelled to contribute to a compensation fund to provide for payment of awards to injured employees, in lieu of liability in damages in ordinary personal injury actions, under the provisions of Laws 1915, chapter 124. The act is compulsory upon both employer and employee in the extrahazardous occupations enumerated in section 1 of the law, except that no award is to be made for injuries resulting from the employee's own culpable negligence. The compensation fund is to be administered by the state treasurer and is to be constituted by collecting from employers affected by the law assessments equal in amount to 2 per cent. of the wages of employees engaged in extrahazardous occupations. The act provides for adjustment of claims by the district courts.

Discussion as a Means of Practical Education

In an interesting article entitled "The Influence of Technical Journalism on Mining Education," which appeared in the *Mining and Scientific Press*, Feb. 12, 1916, T. A. Rickard says, "The best of existing technical papers is so far behind the ideal that there remains unlimited scope for further endeavor." With a nearer approach to the ideal, Mr. Rickard continues, "Technical journalism may be powerfully educative," but concludes, "at present it is content usually to be intensely instructive."

In the same article Mr. Rickard well defines education as "the drawing out of the best faculties of the mind," and adds, "instruction is the conveyance of knowledge" to the mind of another. He criticizes journalism of today as giving information to men engaged in the application of science to industry by furnishing news of the progress made in mining operations and chronicling events of technical importance and commenting on them, all of which he truly says "is usually instructive, but rarely educative."

With this preface Mr. Rickard emphasizes the fundamental principle of all true technical journalism by bringing out the fact that, being scientific in its treatment, it is to that extent educative, since science demands, first, careful observation and, second, the accurate statement of facts.

This brings us face to face with what should be the rock foundation of the technical press. Science is knowledge, and all knowledge is truth. Let the pages of technical journalism, then, strive more than ever to be loyal to truth in every phase of the industries they represent. This can only be fully and successfully accomplished by inculcating a high regard for truth in the contributors of articles and news items and by investigating the claims of advertisers in their columns.

Carrying the thoughts here suggested a step farther, we want to say that one of the greatest agencies in eradicating fallacious schemes and wiping out the many bad practices in all industries, and especially in that of coal mining, is the frank and open discussion of such schemes, methods and practices as are in use or are, from time to time, suggested. Discussion is the one great test of practical utility, because it reveals the different conditions that must be met in the practical application of ideas and establishes the limitations of practice.

Too many practical men are prone to regard an idea or a suggestion from their own limited viewpoint. Because a certain method or practice has proved successful in one instance is no guarantee that it will prove likewise successful in all cases and under different conditions. Discussion develops these facts and broadens the conception of mining men. In this respect discussion is a truly educative factor in journalism. It is one that *Coal Age* has endeavored to foster in its columns from the time of its first issue, and we are proud to say that our readers have learned to appreciate and use the discussion columns of the journal freely. We may add that we greatly appreciate, on our part, the frank and truthful expression of contributors to these columns. We urge a continuance of this means, which we believe is one of the strongest possible factors in the education of practical mining men.

Mine-Ventilation Stoppings

The United States Bureau of Mines, in coöperation with the State of Illinois, has just issued Bulletin 99, "Mine-Ventilation Stoppings, with Especial Reference to Coal Mines in Illinois," by R. Y. Williams.

In this report an attempt is made to discuss the first cost of each of several types of mine-ventilation stoppings, as well as the total annual expense of maintaining a stopping during its required period of service. Such data furnish a basis for comparison of the efficiency of the different types and are of great importance to an engineer planning the development of a mine. The data given were obtained through an investigation conducted under a coöperative agreement between the Bureau of Mines, the Illinois State Geological Survey and the department of mining engineering of the University of Illinois. The report itself is published by the Bureau of Mines as a contribution to the literature on safety and efficiency in coal mining.

The author makes the following deductions as a result of his investigations into the various types of stoppings:

"One of the most obvious conclusions from the inspection of several hundred stoppings is that the efficiency of a mine stopping to prevent the leakage of air depends more on the care with which the joints are made than on the material that is used in construction. Some concrete stoppings were found to leak large quantities of air because they were not set into the rib, and new tongue-and-groove stoppings were tight when carefully constructed. The amortized first cost is a small item compared with the maintenance and efficiency charges, and the cost of cutting a latch in the rib is only a small part of the initial expense. The preparation of grooves in the ribs should therefore always precede the erection of stoppings.

"A general protest is being made against high velocities in the ventilating currents in coal mines. The practical facts on which this protest is based are as follows:

"The amount of power required to move a given volume of air increases directly as the cube of the velocity. If leaky stoppings make it necessary for the fan to deliver four times as much air as would be required if the stoppings were tight, the cost of the power to move the larger volume of air would be 64 times that for the smaller volume.

"As the temperature and the relative humidity of the upcast at any time are approximately constant throughout the year, the quantity of moisture extracted from the dust will vary directly with the quantity of air in circulation. If therefore the fan furnishes four times as much air as would be required if the stoppings were efficient, the amount of water extracted from the mines during cold weather would be increased nearly fourfold. The drying out of coal mines in the winter causes a dangerous condition to exist in the event of a blownout or windy shot or the ignition of a pocket of gas.

"The weight of fine dust that is in suspension in the mine air varies approximately as the cube of the velocity of the ventilating current. This relation has been established by W. H. Carrier, chief engineer of the Buffalo Forge Co., in experiments to determine the weight of material which can be handled by velocities above the critical speed. The greater the velocity of the air, therefore, the larger will be the amount of fine coal dust that will be in suspension and deposited evenly along the entry way ready to assist in the propagation of an explosion.

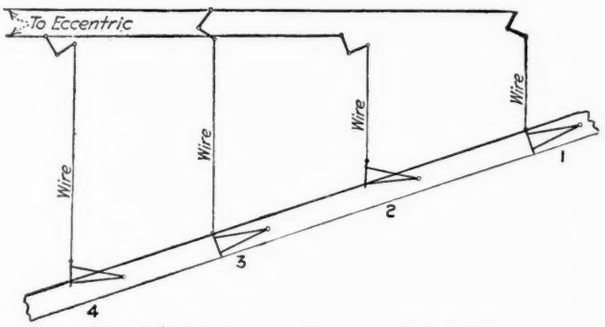
"It is evident that mine economy and mine safety require that stoppings along the main air passageways should be efficiently installed and maintained."

A copy of this bulletin may be obtained by addressing the director of the Bureau of Mines, Washington, D. C.

Retarder for Steep Chutes

The accompanying illustration shows diagrammatically a retarder used in the chutes at the Rendham colliery of the Jermyn Coal Co. Sometimes the space in a breaker is so distributed that it is necessary to put in chutes with steep slopes. In such cases the coal moves too rapidly and is badly broken. Of course the best plan is to have the chutes at just the right angle to let the coal slide slowly, but the next best thing is to retard the coal if it moves too rapidly.

The device illustrated consists of a number of hinged gates set in the chute so that they will close by their



DIAGRAMMATIC VIEW OF RETARDER

own weight if released. They are raised by wires or by rods which are moved by bellcranks which may be operated by eccentrics, the motion being transmitted to the bellcranks by wires or rods.

The gates are so moved that alternate ones are closed or open at the same time. Thus, in the illustration, No. 1 and No. 3 are closed while No. 2 and No. 4 are open. The coal will collect above No. 1 and No. 3, and when they are raised, it will slide down until stopped by No. 2 and No. 4, which will then be closed. In this way the coal slides only a few feet at a time and does not acquire such high velocity as to be broken.

Employing Children in Utah

A law enacted at the recent session of the Utah legislature reads: "No child under the age of 14 years shall be employed, permitted or suffered to work in any capacity in, about or in connection with . . . any mine, coal breaker . . . "—Session Laws, 1915, chapter 61.

Utah's "Pure" Coal Law

Chapter 55 of Utah Session Laws, 1915, provides that "no person shall sell or exchange, or offer or expose for sale or exchange, coal of any particular name or designation, or as the output of any particular mine under the name or designation of another coal or mine." Violation of the statute is punishable as a misdemeanor

The Labor Situation

SYNOPSIS—The bituminous miners and operators of the four competitive states failed to agree at the Mobile, Ala., meeting and adjourned on Feb. 17 to meet in New York City on Feb. 24. The anthracite miners met the operators in the same city on Feb. 21 to discuss the wage scale. The central Pennsylvania conferees meet at Du Bois on Feb. 29.

As was anticipated, the miners and operators at the Mobile conference came to no agreement in regard to wages. The main difference is regarding the establishment of the run-of-mine scale. Van Bittner, president of the Pittsburgh district, declares the miners will have that or nothing.

The operators of Ohio seem willing to concede the run-of-mine scale with certain protective provisions. Ohio is already working on that scale, but it was thought that the operators would try to get back to the conditions obtaining before the last scale was signed, when Ohio paid its miners on a screened-coal basis. Especially did this seem likely, for an amendment has been passed to the Green antiscreen bill making payment for screened coal legal. Illinois has a run-of-mine schedule. So has central Pennsylvania, but that part of the Keystone State was not represented at the conference.

Uncertain Attitude of Indiana Operators

Indiana has a double standard, paying like Iowa for run-of-mine when coal is sold as mine-run and not divided into sizes. But Indiana is apparently weakening on the run-of-mine demand. P. H. Penna showed this on Feb. 16, the day before the meeting closed. He said, it is stated, "I am even willing to negotiate a new contract that includes a slight increase, but before doing so I should report back to my organization. I have no instructions from the other Indiana operators to grant the mine-run provision or the wage increase."

But if there is any one thing more clear than another it is that the Pennsylvania operators are set on not conceding this demand despite all the pressure of the "work at any price" people and the insistent attitude of the miners.

The closing development of the session was the appointment of a subcommittee on Tuesday, Feb. 15. This was composed of eight miners and eight operators, the international officers being ex-officio members. But the subcommittee could do little more than the whole body of conferees, and on Thursday, Feb. 17, the conference broke up apparently without result except the decision to meet again in New York City on Feb. 24 in the McAlpin Hotel—the place where the anthracite miners were to meet the operators on Feb. 21.

Meantime the mine operator delegates will meet their fellow operators, and they may possibly go to New York City prepared to make some concessions on the mine-run and wage demands. It looks as if Pennsylvania was adamant on the mine-run question and pliable as to wage, whereas the other states take a reverse viewpoint and perhaps would rather see western Pennsylvania struggling with the same run-of-mine provision that has severely vexed them. That being the case there may be a split in the ranks as in the past and as was somewhat confidently expected at Mobile.

Bituminous Operators Convene in New York

It was the mine operators who proposed meeting again in New York City. They do not appear to regard their refusal as final, and J. P. White is quite hopeful. He told the operators on Feb. 10 that they came to Mobile with the express expectation of framing a wage scale.

So far from holding aloof at a distance of 1,320 miles from the anthracite meeting, the opposite plan is adopted, and perhaps as a result meetings between anthracite men and bituminous coal men will alternate till an agreement is reached in one or both sections.

This is the better plan; the Mobile meeting merely subjected everyone to much trouble without result. In fact, more is done in private conferences between individuals than can be achieved in a general conference, and such discussions of bituminous prices may well take place while anthracite conferences are in session, and vice versa. The operators of the soft-coal region can also get together during the sessions of the conferees representing the hard-coal mines.

President White and his lieutenants are welcome in New York, and it is to be hoped that while here they will show a readiness to admit that the miners' demands are such as to make necessary an advance in the price of coal. The public is looking for their statement. If they declare the anthracite industry can, like the legendary pelican, feed its young with the blood from its own breast, then the public will refuse to grant the increase in price which will alone make the advance in wages possible. The operators will regret that stern necessity almost as much as the leaders of the miners, but they will have no choice in the matter. It is remarkable that hitherto White and his associates have taken the one course which will make all their work ineffectual.

The "Financial American," commenting on the situation, talks of the "campaign between operator and miner for public support." It should not be a "campaign between" but one "of both" for the approval of the consumer. Their mutual recriminations are foolish. The operators are trying to show that the miners do not need more wages. It is well enough to show they are making a fair and more than living wage perhaps, but it is not well to suggest that there is no reason for a better remuneration based on the wage increases all over the United States. Similarly the miner is stupid to try and show that the operator can pay 20 per cent. more wages out of profits, which is not true as the miner well knows.

The "Wall Street Journal" prognosticated on Feb. 11 an increase in wage and a recognition of the union. This recognition, however, would not, the "Journal" thought, involve the introduction of the checkoff. It was of the opinion that prices would also be raised.

The central Pennsylvania miners and operators will meet in conference on Tuesday, Feb. 29, in Du Bois, Penn. It is stated that 600 delegates will be present representing some 45,000 union miners in Blair, Cambria, Huntingdon, Indiana, Armstrong, Clarion, Elk, Jefferson and Clearfield Counties. On Friday, Feb. 18, the operators held a preparatory meeting to discuss their viewpoint relative to the wage scale.

West Virginia Union Replaces District 30

The new union just formed in West Virginia is the result of the injunction brought by the United Mine Workers of America to prevent the insurrectionary "District No. 30" from proclaiming itself a part of the United Mine Workers' organization. The men have decided that if they cannot have a district of their own, they will have a union entirely independent of the West Virginia district (No. 17).

The international officials of the United Mine Workers are determined to put an end to the disorder and have assumed control of the affairs of the district regarding which there is so much dissatisfaction. The union has had trouble with charges of dishonesty in three districts recently, and the Illinois situation is decidedly unsatisfactory, for the secretary of that district is in almost open rebellion. White is strongly intrenched, and the union is on the whole strong, but it has its points of disaffection which take a heavy hand to curb.

Thomas Cairns, the president of district No. 17, declared on Feb. 11 that he would not for one moment permit the executive board to take charge of things. He said that "the secessionists at the Indianapolis meeting agreed to bring about a settlement of all differences in the West Virginia fields" on their return home. Instead they formed a new organiation.

The agreement with the new West Virginia Mine Workers' Union, according to C. F. Keeney, the president, and Lawrence Dwyer, the secretary, states that "the coal companies agree to pay any advances during the life of the said agreement that may be paid in the four competitive states or the surrounding organized district of this state." How "advances" is to be interpreted is of course difficult of determination. It is to be hoped that the clause will not be regarded as a promise merely to pay equal percentage increases in wage instead of an identical advance per ton or per hour.

The nonunion mines south of the Kanawha and New River fields could well make a specific promise to their men and a declaration to the union fields that they would do no less than their neighbors when the scale was determined. As a matter of fact the operators in the four competitive states feel but little comfort from the rise in wage in the coking regions, which are but slightly competitive, or in the fields shipping to the East which have the market for steam coal largely in their own hands. They are looking for assurances in particular from those parts of West Virginia which ship West and are strongly competitive with the Pittsburgh, Ohio, Illinois and Indiana fields.

It is stated in Ohio that on Apr. 1 many of the operators will close their mines for spring repairs. A scale committee will be elected at the Moose Home in Bellaire on Mar. 14, and the convention will decide what local demands are to be made on the operators of eastern Ohio.

More increases in wages are reported in the bituminous fields. Perhaps it is not fair to mention any because so many must necessarily be overlooked. The Knickerbocker Smokeless Coal Co., at Hooversville, in the Somerset County coal field of Pennsylvania, has given notice of a 10-per cent. increase to take effect with the pay made Feb. 16. According to President D. E. Thompson, the miners of the Amerford Coal Mining Co., near Blairsville, are to have an increase of wages. The Cumberland Coal Co. has granted an increase to its men at Douglas, Tucker County, W. Va.

Miners at Thomas Demand a Larger Advance

But at Thomas, W. Va., it is said the miners are not satisfied with the readjustments, and 1,100 men of the Davis Coal and Coke Co. are idle. They laid down their tools on Feb. 17. It is said that the size of the car has been changed, having been made smaller. The price paid for mining and loading the former large car was $1.23½. The filling of the smaller car is awarded with 90c. This the men do not think is enough.

They also object to being docked for more impurity than they send out on any car. They want a better price for dead work, the abolishment of the coupon system and the discontinuance of the company stores. The company declares it is at a loss to know the nature of the trouble. A voluntary increase of 2½c. per ton and 10c. per day was granted on Feb. 15, and these figures were to have been raised to 4½c. a ton and 15c. per day on Mar. 1.

Raised Wages Should Await New Contracts

Believing that prosperity is a good cause for wage increases (though low prices are not thought a reasonable cause for a lowered wage) the miners of the Consolidation Coal Co., of Fairmont and Clarksburg, are showing some discontent despite the recent wage increase. Senator C. W. Watson has therefore explained that there are a number of outstanding contracts which will not run out till between April and September. These contracts are being filled despite the shortage of cars, and in some cases it has been necessary to buy coal at a high price for that purpose. So the emergency prices, though they sound alluring, are quite hard to secure except by small operators whose output is not preempted. But the high price received for some deliveries has been regarded as typical rather than as applicable to only a part of the coal shipped. Senator Watson adds:

The coal business today is conducted with great difficulties, and the margin of profits is necessarily uncertain. The railroad embargo of coal, the high water-freight rates, war risks and other conditions are making the business most difficult at present. For instance the freight rate by water from Baltimore to Boston was 65c. before the war. Now it is $3.75. The rate to the Mediterranean was formerly $2.50; now it is $27.50. A steamer that our company chartered before the war for $17,500 a trip cost us $182,000 the last charter. These figures show that it requires among other things greatly increased working capital and extra hazards to engage in our business.

The close competition in the Sunday Creek Valley of southern Ohio has caused several of the miners to start to work the mines on a coöperative basis, and the union as usual has demurred. The United Mine Workers of America has threatened to put these men on the "unfair" list and to suspend them from the organization for 25 years. As in Illinois, starting a coöperative company is only another way of accepting a large reduction in wage without openly disregarding the scale. Several socialists are taking part in this coöperative movement.

Big Rise in Price of Powder Causes Strike

A strike against the higher price of permissible powder and detonators took place on Monday, Feb. 7, at the Culmerville mines of the Ford Collieries Co. That company has been selling detonators at $4.90 per hundred, but the men want two for 5c., or to buy at the rate of $2.50 per hundred. It is said the caps actually cost the company 4¾c. apiece. Powder is made into cartridges by the company and the men pay 8c. apiece for them. They want to purchase them for 5c. apiece.

It is alleged that the prices of these explosives have recently been changed, the company alleging—doubtless with truth—that the cost of these articles has risen owing to the war and it cannot continue to supply them at the old figure. The miners are unorganized and are said to be exercised over the fact that they do not have a checkweighman. The Russians are said to be the main trouble makers and to have struck first. The strike spread to the Curtisville mine, and about half the force at the Superior mine came out. On Saturday, Feb. 12, 15 deputies were detailed by the sheriff owing to an attempt being made to dynamite two small buildings of the Ford Collieries Co. On the Sunday following, the men attempted to enter a church to hold a mass-meeting, but were frustrated, and then tried to meet in a moving-picture theater. Finally they met on the platform of the Bessemer & Lake Erie R.R. All these charges have been denied by representatives of the striking workmen. The state constabulary has been keeping order, but it is alleged that the company had a number of Pinkertons on the property.

Ford Collieries Co. Miners Make Good Wages

The company offered an advance of pay in lieu of a decrease in the cost of explosives. The rise in scale is about 7 per cent. and applies to all classes of work. On Feb. 16, 600 of the 900 miners returned to work under the protection of the state constabulary troop commanded by Captain T. F. Wiechard. The Bessemer Coal and Coke Co.'s mine at Russelton was also affected by the disorder and discontent, but this mine resumed at the same time. The sheriff states that the Ford Collieries Co. men are making from $150 to $200 every two weeks. The miners claim that this is not true. Ed Callahan worked, they say, 13 days, making in all 127 hr., and received $33.93 as his day-work allowance. John Renosky worked 17 hr. a day at the coal face for the same 13 days and made $39.60, payment being on tonnage produced.

The miners of these companies are certainly not unhappily situated. A bank was started for the benefit of the miners a few years ago, and the deposits to date amount to $63,000. Most of the men own their own homes, in which pianos, phonographs and other expensive pieces of furniture may be found.

Anthracite Socialists Want $5 Minimum Wage

The Industrial Workers of the World have been tying up operation at the mines of the Delaware & Hudson Co. in Greenwood. The strike commenced on Thursday, Feb. 10. They want $5 per day for everybody—doortenders and skilled mechanics. The district officials oppose the laying idle of the mine with its 70 United Mine Workers, but there is a lodge of the Industrial Workers of the World with 400 members and they can tie up the mine whenever they so desire.

They have notified the coal company that they will not be bound by any agreements made by the miners' union. Joseph Ettor, one of the leading Industrial Workers of the World, has been traveling from one town to another obtaining recruits in the anthracite fields. The United Mine Workers have succeeded in winning back some of the new-found converts of Ettorism.

Recently a dispute arose between the union miners and the industrial group at the William A. colliery. The union men refused to work with the trouble makers and decided to demand that each man show his union button. In the afternoon a meeting was called, and six I. W. W.'s were excluded from the hall. These men ran to a meeting where Ettor was making a speech and soon returned with about 20 men. One of the I. W. W.'s drew a razor and started to slash the union guards at the door. He was turned over to the police and proved to be not even a William A. colliery employee. At William A. the men were told that they could leave the I. W. W. or the service of the company, and as the miners' local union was favorable to this form of beneficent coercion the men submitted and left the I. W. W. organization.

Anthracite Labor Conference

SPECIAL CORRESPONDENCE

The first detailed consideration of the demands made upon the anthracite coal operators by the mine workers will take place in the Hotel McAlpin, New York, next Monday, Feb. 28, at 10 a.m., when the joint subcommittee consisting of four operators and a like number of representatives of the miners' union will meet. This meeting was arranged at a conference held at Hotel McAlpin, Monday, Feb. 21, at which the general committee of operators and the scale committee of the miners were both present.

The members of the subcommittee are W. L. Connell, president of the Green Ridge Coal Co.; W. J. Richards, president of the Philadelphia & Reading Coal and Iron Co.; S. D. Warriner, president of the Lehigh Coal and Navigation Co., and Morris Williams, president of the Susquehanna Coal Co. The miners' representatives will be John P. White, John T. Dempsey, Thomas Kennedy and James Matthews, presidents of Districts Nos. 1, 7 and 9 respectively. Alvin Markle, of the G. B. Markle Co., of Hazleton, will be the chairman of the subcommittee, without vote, and the secretary will be James A. Gorman, who is secretary of that Anthracite Board of Conciliation which the miners has so much criticised.

The meeting on Feb. 21 was attended by many operators and 35 members of the miners' organization. At it White presented the demands as formulated at the tri-district convention held in Wilkes-Barre last September and indorsed by the Indianapolis convention last month. On their conclusion his remarks were liberally applauded.

White's Argument in Behalf of Demands

The miners' president followed up the reading of each demand with a brief comment giving reasons for its acceptance by the operators. He told them that the miners believed they should have some of the benefits that accrue to workmen in other lines and called attention to the increased cost of living, maintaining there should be an increase in wages. Taking up the demand for an 8-hour day he said it would not permit of argument as it was recognized by the American public as a reasonable workday. He said the time had arrived when the public did not look with favor upon industrial suspension and that a period was drawing near when these conflicts would cease. The public, he said, would demand that the councils of the opposing bodies get together and arrive at an understanding that would be reasonable and fair to the parties involved. Acting upon this theory, he said the miners at their recent convention had adopted the nonsuspension policy. He insisted upon complete recognition of the union as it would eliminate local strikes, promote peace and create the basic force necessary for a speedy settlement of disputes.

District President Kennedy spoke of the cost of powder as an element of production and quoted figures in support of his argument. He also took up the objections to the Board of Conciliation and said that the cost of referring a dispute from that board to the umpire averaged $83.

Remarks in support of the demands were also made by the other district presidents, Dempsey and Matthews, and by the board members, C. C. Bonner and J. F. Hollister.

Warriner Suggests Broader Social Contract

The reply for the operators was made by Warriner, who said that they would look at the demands from every possible light in an effort to arrive at a solution that will be satisfactory to all concerned. He said the operators were willing to stand for reasonable conditions of labor and pay and would go beyond this and give consideration to the opportunities for social and physical betterment of the miners. In doing this he said the operators must realize their own business conditions and have regard for the interests of the public. He assured the miners that every element of the demands presented would have the fullest consideration.

It was then decided that the demands be referred to the subcommittee to report its recommendations back to the general joint committees. An adjournment was taken until Monday of next week so that the bituminous conference could resume its sessions in New York on Thursday, Feb. 24. It is hoped that this bituminous meeting will be concluded before the time set for the resumption of the anthracite session.

Everyone was happy when the meeting adjourned. This was particularly true of the miners' representatives. Earlier in the day Mr. White from his headquarters in the Continental Hotel issued a statement in which he said:

The United Mine Workers have left nothing undone to protect the interests of the public. In 1914 and again this year the national convention went on record against any stoppage of work at the expiration of contracts. Our members realize that the public suffers from even a temporary shutdown, and we have acted with full consideration for the public's rights and interests. The public can bank on this: There will be no stoppage of work in the anthracite field due to the action of the miners, so long as the operators show any disposition to reach an agreement. We are hoping and expecting an early agreement that will be satisfactory to all concerned, but if an agreement is delayed for any reason, we are prepared to continue negotiations while there is the slightest hope of coming together.

Only Contract Miners Make $700 a Year

On Sunday last Mr. White gave out a statement in which he said the miners were going into the conferences with every confidence that the operators will recognize the justice and reasonableness of the demands. He said:

Conditions in the anthracite fields have grown worse instead of better, because the cost of living has gone up faster than wages. The average anthracite mine worker gets far less than enough to support his family in decency. The only class of workers in the anthracite industry that make more than $700 a year are the contract miners, and they represent less than one-fourth of the total number employed. The annual earnings for miners' laborers, other inside men and outside workmen average not more than $600 a year. The United States Bureau of Labor Statistics estimates that a man cannot support his family in decency for less than $750. Even the contract miners do not receive enough to provide against a rainy day or to give their families anything except the bare necessities.

After stating that the anthracite industry is "enormously profitable" and quoting figures, Mr. White says:

As a matter of fact, I do not believe that the operating companies will take advantage of their monopoly of this enormously rich natural resource. It does not seem probable that they will deny the just claims of the men who risk their lives underground, or having granted their demands will make their concessions an excuse for gouging the public.

Representatives of the Contending Interests

The following operators were present at the meeting of the general committees: S. D. Warriner, Lehigh Coal and Navigation Co.; Charles Huber, Lehigh & Wilkes-Barre Coal Co.; W. J. Richards, Philadelphia & Reading Coal and Iron Co.; John Markle and Alvin Markle, G. B. Markle Co.; W. H. Truesdale and E. E. Loomis, Delaware, Lackawanna & Western Railroad Co.; J. B. Dickson, Scranton Coal Co.; W. A. May, Pennsylvania and Hillside coal companies; W. H. Williams, Delaware & Hudson Co.; W. H. Taylor, St. Clair Coal Co.; F. E. Zerbey, Kingston Coal Co.; Frank Pardee, A. Pardee & Co.; E. Ludlow, Harwood Coal Co.; H. C. Boury, Girard Mammoth Coal Co., George C. Graeber, Greenough Red Ash Coal Co.; Morris Williams and R. A. Quin, Susquehanna Coal Co.; C. T. Starr, Trevorton Colliery Co.; H. H. Lineaweaver, H. H. Smith & Co.; George F. Lee, George F. Lee Coal Co.; W. L. Connell, Green Ridge Coal Co.; Abel I. Culver, Anthracite Coal Co.; T. E. Snyder, J. S. Wentz & Co.; C. Pardee, Jr., Pardee Bros. & Co., Inc.; J. L. Kemmerer, Whitney & Kemmerer; John A. Komara, West Mountain Coal Co.; E. S. Stackhouse, E. S. Stackhouse Coal Co.; G. W. Robertson, Excelsior Coal Co.; C. M. O'Boyle, Pittston Coal Mining Co.; E. B. Jermyn, Jermyn & Co. and Traders Coal Co.; James B. Neale, Buck Run Coal Co. and Darkwater Coal Co.; H. H. Brady, West End Co. and Melville Coal Co.; Warren Delano, Mill Creek Coal Co.; W. T. Payne, East Boston Coal Co. and Raub Coal Co.; R. C. Hill and P. C. Madeira, Madeira, Hill & Co.

The miners had several representatives present, as follows:

International Officers—John P. White, president; Frank J. Hayes, vice-president, and William Green, secretary.

District No. 1—John T. Dempsey, president; John M. Mack, secretary-treasurer; Joseph Yannis, vice-president; Thomas Davis, international board member; Stephen Reap, David Fowler, B. L. McCue and Peter O'Donnell, district board members.

District No. 7—Thomas Kennedy, president; Andrew Mattey, vice-president; John Yourishin, secretary-treasurer; N. J. Ferry, international board member; Michael Hartready, Patrick Dougherty, Leo Morelly, Steve Batcho, Michael Durishin, John Gaffney and Steve Turk, district board members.

District No. 9—James Matthews, president; John Stranbo, vice-president; James J. McAndrew, secretary-treasurer; Martin A. Nash, international board member; George Litvern, Stiney Geguzie, P. F. Sweeney and John F. Hollister, district board members.

Telephones in Coal Mines

Steady progress is being made in the installation of telephones throughout the anthracite mines of Pennsylvania. In the mines of practically all the large companies there are now instruments at the foot of every shaft, at the head and foot of all main slopes, in the mine hospitals below ground and wherever there is machinery for pumping or hoisting. Breakage of machinery, fires and accidents can thus be promptly reported, and the telephones form a speedy method of communication between the footmen and hoisting engineers in case anything goes wrong with the signal system. Orders can be transmitted easily. The installations have proved a valuable adjunct to car dispatching, and some of the engineers in charge of this work pronounce it one of the greatest steps in efficiency, and consequently in safety, of recent years.

Credit is due to Chief James E. Roderick, of the Pennsylvania Department of Mines, who strongly recommended the further extension of mine telephones three years ago. Some of the large companies have the mine systems connected directly with those on the outside, so that instead of taking the time to come out of the mines or having their messages relayed at the switchboards in the colliery offices, men wishing to report can call up the main office direct. In case of mine fires or

accidents it has happened that a man at the scene of the accident or within view of the fire has called the main office and secured prompt assistance. This means that the fire or rescue cars can start within a few minutes after the accident or fire is known. Many lives have been saved by the prompt summoning of a first-aid team from the nearest mine hospital.

In addition to the systems permanently installed in the mines, the rescue and fire-fighting squads are provided with portable instruments equipped with reels of lighter wire, so that the service can be temporarily extended to any point where it is needed. Special insulation is necessary for the permanent wires to protect them from the destructive sulphuric acid present in mine water, and the transmitters and receivers are installed in special boxes protected with paraffin.

There are now thousands of telephones in the mines in constant use. All vagaries of the air currents are promptly reported to the mine foremen, and when the presence of gas is detected or a pocket of it released, that part of the mine can be immediately vacated until the gas is swept away. The effect in reducing loss of life as well as in saving property has been enormous.

Interesting Fatality Figures

"Safety First" has been a popular motto for several years. It has been "adopted," lived, practiced and "monkeyed with" long enough so that some few visible, tangible results of safety propaganda are beginning to appear. These if properly arranged and tabulated may be made comparable.

It is hardly equitable to compare figures of accidents and fatalities in one field with those from another without due consideration to the natural physical conditions existing in the two localities. The accompanying table shows some potent figures from adjoining fields in West Virginia.

FATAL ACCIDENTS IN TEN LARGE COAL COMPANIES IN THE NORFOLK & WESTERN FIELD FOR 1915

	Tonnage Produced in 1915	Total Number Employees	Fatalities	Tonnage Produced per Fatality	Average Employed per Fatality
United States Coal and Coke Co.	1,618,491	1,663	1	1,618,491	1,663
Pocahontas Con. Collieries Co.	1,905,775	2,301	16	119,673	144
United States Coal and Oil Co.	1,842,951	1,369	5	368,590	274
Main Island Creek Coal Co.	414,041	425	1	414,041	425
Carter Coal Co.	670,697	792	7	95,815	113
American Coal Co.	566,762	669	1	566,762	669
New River & Pocahontas Con. Coal Co.	548,040	686	4	137,010	172
J. B. B. Coal Co.	414,345	472	3	138,115	157
Red Jacket Con. Coal and Coke Co.	378,188	517	2	189,094	259
Logan Mining Co.	347,041	315	..	.....	...
Totals	8,706,331	9,209	40	217,658	230

It will be at once noted what a striking predominance these figures reveal in favor of the United States Coal and Coke Co. The mines of this firm are located in the southern part of McDowell County, in the western portion of the Pocahontas field. Natural conditions are probably as bad here, and in many respects worse, than in any other region covered by the table.

The fatality record shown is therefore in no sense the result of chance or luck, circumstance or good fortune. On the contrary this record reveals the result of years of consistent, persistent, never-flagging effort to forestall accident by every means that human ingenuity can devise or that human skill can execute—in short, the result of making "safety the first consideration" a life, not a creed.

Motion Pictures for the Coal-Mining Towns

A large proportion of the money spent for amusement by the anthracite mine workers of Pennsylvania goes to the numerous motion-picture theaters. A moderate estimate places the sum at $2,500,000.

Half a dozen years ago there were only nine motion-picture theaters in Wilkes-Barre, with an aggregate seating capacity of 1,800. At the close of 1915 the aggregate seating capacity of the 16 motion picture theaters in that city was over 10,000. Of these theaters one represents an investment of $200,000, one of $150,000 and a third of $50,000, as compared with the $4,000 or $5,000 which was the average cost of the little theaters of six years ago. The price of admission ranges from 5c. to 20c. and most of the theaters give performances from 10 o'clock in the morning until 11 at night. Prominent film men state that at the extremely moderate estimate of filling the theaters only once a day the aggregate daily receipts are $750, or over $225,000 a year.

There are four film exchanges in this city of 67,105 inhabitants, an unusual number for a city of the size; but it is in the center of the anthracite region, which is stated to have more motion picture theaters per square mile and more seating capacity per capita than any other section of the United States except the big cities. Every little hamlet in the region now has two or three theaters.

The population of the anthracite counties, according to the latest census report, is 974,916 persons, so if Wilkes-Barre with a population of 67,105 spends $225,000 a year on motion pictures, the total expenditure throughout the region is probably about $3,262,500. The anthracite mine workers, their wives and families, number 850,000 persons, or 87 per cent of this population. This means that at least $2,500,000 of their wages are spent annually on motion pictures. The proportionate calculation makes it $2,858,375.

A VIEW SHOWING THE GREAT THICKNESS OF COAL SEAM IN THE OAKDALE MINE NEAR LAS VETA, COLO.

Editorials

Differences in Wage Rates

Differences in wage rates are sometimes due to the ease or difficulty with which coal is dug and the simplicity or multiplicity of the means taken to dislodge it, but sometimes and perhaps more often they are due to the wage conditions existing in general when the field was opened or to the resistance offered by certain sections when wage scales were being readjusted elsewhere.

It is not the softest coal which always pays the lowest wage; the absence of sulphur is not always proved by a low tonnage rate; a low compensation per ton does not always arise from the fact that the coal parts easily from the roof or is clean, nor from the chance that the draw slate is absent or prone to stay in place.

If it were so, the equal percentage increase might be justified from that point of view; for if it be granted that a certain definite amount of time and energy is needed at one mine and twice that time and energy is needed at another for the obtaining of a like result and if the wage is proportioned accordingly, the percentage increase would insure a continuance of equal earnings in the two mines.

And if the lower wage scale resulted always from methods being practiced that were favorable to the miner, the equal percentage increase might find in that fact a large degree of justification, because the outcome thereafter would still be equal between miners in the various mines or mining sections. But this is not so; some of the easiest coal to mine has a high-wage scale and the most difficult methods are found where the scale is lowest.

The Connellsville region has adopted, for instance, a form of mining which involves more labor than that used in Illinois, while the coal in both is mostly shot from the solid. In the Pittsburgh region the form of mining is more favorable to the miner than that employed around Connellsville so far as the difficulty of attacking the coal is concerned, but as a counterbalance the coal in the Connellsville field is shot from the solid, fine coal being more desired than large; for while the coking coal cannot be too fine, industrial and domestic coal brings more money when not small. Then again the Connellsville coal is the more friable and easy to mine and drill.

It will be seen then that one cannot argue with any certainty that the price of mining reflects correctly the labor of its accomplishment. As regards Pittsburgh and Connellsville the argument conceivably might stand. The matter is certainly one for discussion. Relative to Illinois and Connellsville it certainly is not valid, and West Virginia and Kentucky have rates which illustrate that wages do not mirror the amount of labor for which they are paid.

The low wages in the latter states arise not from ease of mining, but from the labor market obtaining when the fields were opened. The wages paid to the "sagers" looked large to them when the fields were opened up. No encouragement was at that time needed to draw them from their tumbledown shacks in the fields to the decent or only fair homes provided at the mines. No difficulty was experienced in getting them to leave the raising of farm products for which there was little or no demand for the comfortable wages afforded them by the mine owners.

Many unpleasant things have been said of West Virginia and Kentucky operators in the past, but this must be conceded them—they paid higher wages than the men they employed had formerly earned and the families dependent on them were more prosperous than ever before. Moreover, when their critics from Pennsylvania and Ohio went down to West Virginia they paid the same wages and exacted like conditions.

But the wage was based on previous conditions, not on the work involved in mining. The scale was really low compared with that in neighboring states, and by it the West Virginia operators made their way against the competition of rivals and obtained a market marked by somewhat definite though irregular lines. The welfare of the miners in West Virginia and Kentucky is bound up in the maintenance of those markets. It is their "vested interest" which they cannot afford to forfeit for any inconsiderate increase of wage. Wage rate is nothing if one cannot get work.

But there is no need to enlarge West Virginia's definite "area of penetration"—to use a word now so well known in diplomatic colleges. To extend it will only result in closing mines elsewhere, in laying large numbers of men idle, or in causing, as has happened lately, their migration from state to state.

As the wage scale is arbitrary and was never based, even roughly, on the labor involved, the increases may well be made arbitrary also and equal to those made elsewhere. Only by such a method can the markets of neighboring states be kept inviolate and the comity of operators be maintained unimpaired.

Wage rates, it has been said, are made high by union effort. This is largely putting the cart before the horse. The high-wage districts were those in which the union first found its start. The high wages arose from the demand for labor and the high prices for coal were the cause of that demand. The operators were so anxious to get men and to operate their mines that they not only offered high wages, but conceded the demands of the union. Later, when competition impoverished the coal operators, they became so weak financially that they dreaded strikes and were an easy mark for determined men.

But the operators where wages were low had men who were anxious for work, and concurrently they made so much money that they could afford to put up a strong resistance to changes in wage scale. Furthermore, as they had much to gain or lose by nonunion operation, they were the more stiffened to its defense.

The union has not done so much for wages as has frequently been credited to it. When it is established, it

usually has to recognize existing conditions, even if it does not really sense the causes for them; for the opposition of the operators prevents such extensive rises as will bring wages up to a true parity, because such rises will result in complete idleness after a strike, and the operator may as well extend the period of stagnation before the scale is signed as find it extended indefinitely thereafter.

But everyone can agree to give the identical wage increases whether times be good or bad. They rightly say that no local increase should be based on a temporary embargo or business flurry, but surely if all producers add an equal number of cents to the mining rate little harm will be done to any of them. But if the rise is not both general and identical one cannot blame the states that are already overburdened from declaring that their load has been made so heavy that they cannot add to it till collective bargaining is all that the name implies.

Bonus of Thirty Cents a Day

These remarks are made on the following premise, which may or may not be justified by the outcome of events: It is assumed that the conferring operators will find that the nonunion coal producers will agree to raise their wages identically in accord with the increase in the union mines and that these same union operators will increase their wages accordingly somewhere about 10 per cent. No one could blame them if they refused to grant an increase without the necessary assurance that nonunion areas would give an identical advance with that asked of those who recognize the union.

Let it be ascertained approximately what is the average earning of the miner. In this editorial an accurate determination of that earning will not be attempted, but let it be placed roughly at $3 a working day. A 10-per cent. increase would amount to an advance of 30c. per day in the miner's wages. Why not then pay him as before for his output at so much per ton plus 30c. per day additional if he works 8 hr. in the mines. However, machine men who had cut their rooms or loaders who had loaded the coal undercut could be permitted to go home at once and get their full day.

By this the operator would be sure that the miner would be in his place every working hour of the mine or else he would forfeit his bonus, and thus this provision would make it easier to operate the colliery, because the loading of coal would be more equally distributed throughout the running day. He would also be able to save paying so many men 30c. per day by employing less men and by seeing that they have an opportunity to make a large output. Wherever the men were not making $3 a day the company would be paying more than 10 per cent. as bonus. Wherever the miners were making $6 per day that increase would drop to 5 per cent.

But large earnings like this which will result from increasing the efficiency of miners could not be made without some expense for efficient superintendence, though in many mines a saving would be made simply by not employing so many men. Many railroad coal operators who work steadily the year round have their mines working at such low pressure based on the number of men that though work is steady day by day no one gets more than one or two cars per day and it is hard for any one to make a living whose efficiency is thus trammeled.

The new system will make toward the identical increase in wage for which there is so much need, as the bonuses should be the same everywhere, being based on the day. The question of ton and bushel, size of car, method of weighing and previous scale will not enter into consideration for the bonus is likely to be made uniform from end to end of the country.

It will put a premium on the operator's devotion to the interests of the men working under him. It will enable the miners to earn more money, and the consumer will find that the cost of coal will not increase as fast as the bonuses are made larger. The manufacturer will find there is an increased demand for machinery because it will help the miner to be efficient, and the operator is aided by that efficiency, whereas now he cannot get a better rate of mining if he puts in a more efficient class of machinery or installs a conveyor.

The miner will be asked to take no chances when a new economical machine or method of mining is introduced. The operator will look to obtain his profit out of the fact that he will need to employ less men and so pay fewer employees bonuses.

If this plan is adopted, the year 1916 will not only introduce into Pennsylvania conditions of insurance by which safety measures are endowed and made profitable to the operator, but also conditions of working by which his efficiency in helping his men will be a direct source of revenue. The future is bright if we can arrange that awards will be made to both employer and employees when they together operate the mines in each other's interest.

Perhaps also the bonuses of some of the day workers could be on a tonnage basis so that almost every man would have a direct interest in efficiency, the operator and the mule driver, the superintendent and the cager, the foreman and the miner.

There are of course some objections to this plan which it is to be hoped the readers of *Coal Age* will point out.

The pages of this journal are open to all who favor or view with disapproval this proposed plan of payment, which has been urged before in a somewhat less concrete way.

To some it will be evident that if wages increase as they have in the past and these increases are all granted as bonuses, the latter will soon be almost a day's wage in themselves and there may be some men who will be content to live on what the bonus affords or at least do but little more. That may be answered by saying that the bonus will represent largely the increase in the cost of living, and the miner will need both the bonus and the tonnage award if he is going to maintain his economic status.

Some will say that the possible savings to the operator are inadequate to provide wages for efficient supervision, to furnish the power and to afford the purchase money for adequate machinery. This is true, but the bonus will probably increase later because the tendency of wages is toward a continuous rise.

Others will fear that in many mines a number of men may be laid off when a bonus has to be paid. The lowness of the preliminary bonus is likely to prevent that. A payment of 30c. a day corresponds to $6 per month of 20 working days. The rent lost by reducing the number of men will balance the bonus if the company owns the houses, and all the men displaced are likely to be single men who do not occupy the company houses.

Sociological Department

Locust Mountain Village

By C. M. Young

SYNOPSIS—The houses are built of 4-in. steel sections and hollow tile which is covered outside with cement mortar delivered by a spray and troweled. Asbestos roofing is used on the roof trusses. Thus the buildings are largely fireproof.

The Locust Mountain Coal Co., one of the interests of Weston Dodson & Co., is just completing the first few of a group of mine houses which seem to be, in convenience, durability and beauty, the best that have yet been built. Other houses have been as well placed, others have been as attractive and still others have been designed with equal attention to the welfare of the families, but it is doubtful whether any others have combined all the advantages which are found in these.

The company is working a body of anthracite lying under the summit of Locust Mountain, just north of Shenandoah, Penn. There is no place for the men to live in except in that city, which can hardly be considered a livable town. This is not the fault of the people of that community, for they cannot help themselves. The city is in the midst of a large deposit of coal, and many people are employed in the industry.

The topography is such that the town can grow in only a few directions, and the available land is held at such terms and under such conditions that expansion is discouraged. Therefore the congestion in Shenandoah is like that in the most crowded parts of large cities of which we read so much, and the conditions are by no means desirable. This is one reason for the building of the village on Locust Mountain.

The houses are situated at the top of a steep slope of the mountain, at an elevation of about 1,700 ft. above sea level. Behind them the ground rises gently, while in front it drops off quite steeply, though a short gentle slope immediately faces the residences. The view is across the valley, with Shenandoah lying at the foot of the hill. The space in front of the houses is to be smoothed off and converted into a small park. The road joining village, colliery and town will pass behind the houses. Fig. 1 gives an idea of the layout of the village as it was planned and Fig. 2 shows one of the miners' houses. These dwellings shown are already nearly complete, and it is now planned to extend the village to the west (that is to the left in the picture) by increasing the number of houses to about 100.

There are three types of houses in the village—one-family, two-family and four-family, known as types A, B and C. The superintendent's house is the only single dwelling of the group. On each side of this are double houses for the foremen, and beyond these are four-family houses for miners. In many places it is thought desirable to separate the officials from the miners, but here they are placed in the midst of the group with the hope that the close association will be of benefit to both.

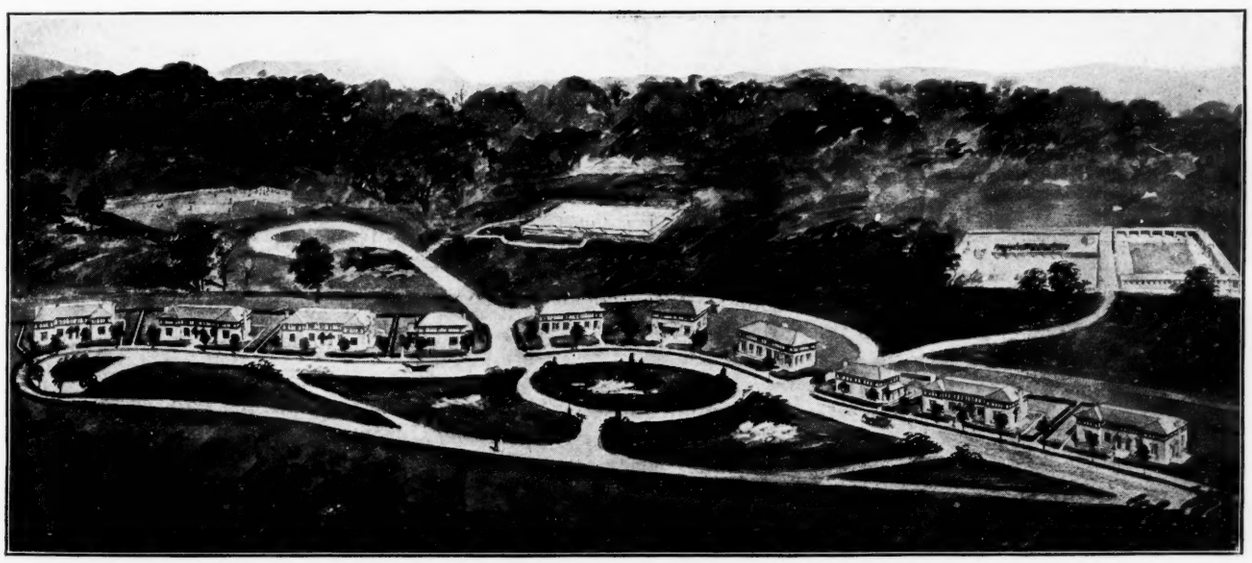


FIG. 1. GENERAL LAYOUT OF MODEL VILLAGE AT SHENANDOAH, PENN.

While the houses of the officials are somewhat more desirable than the others, the actual conveniences, the construction and the finishing are the same in all. Each family has a hot-air furnace, a bathroom with tub, running water and electric lights. In the four-family houses each family has in the cellar a coal bin and a vegetable room. On the first floor there are living room, dining room, kitchen and bath, and on the second floor there are three bedrooms. The attics are to be used as storerooms.

In the other houses the bathrooms are on the second floor, but otherwise the provisions for comfortable living

are nearly the same. The placing of a bathroom in houses for miners has been of doubtful value in the past, but it is the intention that the houses thus far built shall be used by Americans, as far as it is possible to control the matter. An interesting comment on labor conditions is found in the providing of a garage with room for eight automobiles.

Houses of Ferro-Tile and Stucco Construction

To many the most interesting thing about the houses is the method of construction. This is new and apparently well adapted to its purpose. The houses have steel frames with tile walls and stucco finish. This construction was devised by George N. McAlarney, of Wilkes-Barre, and it has been adapted to the requirements of the proposed dwellings and somewhat improved by George S. Welsh, of the same city, who was the architect that planned the village.

On the foundation, 4-in. I-beams are set vertically, spaced 6 ft. apart, except where different spacing is

FIG. 2. TYPE OF HOUSE BUILT BY THE LOCUST MOUNTAIN COAL CO.

required by the dimensions of the buildings or the door or window openings. These beams are bolted to the foundations and extend to the tops of the walls. They are braced until the walls are filled in and the floor timbers laid. The floors and partitions prevent the walls from buckling inward, and tie-rods running across the buildings between I-beams prevent any outward movement. This is necessary because a 4-in. wall of this kind would not have sufficient stiffness to resist wind pressure.

Floor timbers 2x8 in. are laid on 3x5 in. angles bolted to the I-beams. The floors are double. All finishing and the floors are of good yellow pine. The only work required on the joists, after they are cut to the proper length, is the slight trimming necessary to provide a smooth floor, and this is done when they are supported on the angles.

The spaces between the I-beams are filled in with 4-in. terra-cotta tile, which is of special design, tapered for a short distance at one side and shaped so as to fit into the beams. This was found not to be quite satisfactory because the difference in expansion of the metal and the tile caused small cracks in the plaster. In future houses of the same type a change will be made so that the terra cotta will be continuous, at least on the outside. This scheme of construction is new, and some details will be changed as experience shows the possibility of improving them. The outside walls are covered with Gunite, which is given a trowel finish. Excellent results have been obtained in this way. The roofs are of Johns-Manville asbestos sheet roofing, which is very durable and practically fireproof.

There are several advantages in this form of construction. First may be mentioned rapidity of erection. To illustrate, a two-family dwelling was constructed, above the foundation, as follows: Steel and joists, one day; double floors, one day; tile, scratch coat of stucco and roof boards, one day; finish coat of stucco and permanent roofing, one day.

Another advantage is the low fire risk. The exterior is practically fireproof, and the inside of the house would burn out only with difficulty. The floors can burn, but the partitions are well protected by plaster and plaster board. The company will carry no insurance.

Yet the first cost is low, seeing that a nearly fireproof structure is secured. It would be of little use to give the actual figures in this particular case because this is the first time this type of structure has been used for a group of small buildings, and the circumstances here were unusual in that all material had to be hauled up the mountain. A better idea of the cost is given by the fact that it is almost exactly the same as that of a good frame building of the same design. The maintenance cost will evidently be light, because there is little exposed woodwork and no painting will be required.

Built as Better Habitations, Not for Profit

These houses are being erected by the company without any hope that they will be a good investment so far as money alone is concerned. The company needs men, and it must find houses for them, but the building of the best house it could find is a matter of choice rather than need.

For several years it has employed a nurse and physician at every operation, and they both attend all cases of injury or illness and have general charge of the cleanliness and sanitation of the villages. It is the nurse's corps of "white wings" which attend to the regular cleaning up of the towns. She also makes a report on their condition as she finds them, one of the more recent of which contained an item of unusual interest. She found that some of the miners were tearing down the fences around their houses to get their automobiles into the yards.

The company also operates a dairy of certified cows and sells milk to its employees at a loss of about two cents a quart. There is very little pasture in this part of the country, and condensed milk is unsuitable food for some infants, so the company did for the families what these could not manage for themselves.

The village is largely the result of the personal work of T. M. Dodson, the general manager, who takes a lively interest in the men. He has done much to stimulate interest in the promotion of pleasant living conditions, and the employees respond to this work with a loyalty which is really unusual. The reform started some few years ago. Some of the men were watching Mr. Dodson and a few friends shooting clay pigeons. The men seemed interested, and Mr. Dodson asked them if they could shoot. Some of them thought that they could and proved it. Then Mr. Dodson suggested that they form a club. They did so, bought a trap and some clay pigeons and had such a good time that the organization and its interests grew as time progressed until now the men in the association have an investment of several thousand dollars.

Discussion by Readers

Efficient Mine Foremen

Letter No. 29—In my opinion, briefly stated, the following constitute the chief qualities of an efficient mine foreman:

He should possess a good technical knowledge of mining, as well as a practical knowledge of the different systems of working coal seams under different conditions. He should be broad-minded and a good judge of human nature that will enable him to give his orders in a cool and careful manner. He must maintain a firm attitude and enforce discipline by seeing that his orders are promptly and fully obeyed.

A mine foreman must be just and honest in all his dealings with his men and be able to judge correctly when their demands are right. He must be farsighted and be able to decide correctly in regard to the advantages and disadvantages of the different systems or methods proposed for adoption. He must always have a high regard for safety and economy in the operation of the mine. Finally, he must be able to produce a maximum tonnage of coal at a minimum cost.

Carnegie, Penn. JAMES MCGUIRE.

Mine Discipline Imperative

Letter No. 6—I agree heartily with the writers of Letters No. 2, *Coal Age*, Nov. 20, p. 855, and No. 3, Jan. 22, p. 178, when they state that the changes that have taken place in the methods of enforcing obedience in mines have resulted in better discipline being maintained now than ever before. I would say, however, that greater burdens and greater responsibilities now devolve on the mine foreman, and it is only by a never-ceasing vigilance that he is able to maintain a high standard of discipline. The law rightly holds the mine foreman responsible for the enforcement of its requirements, and the passage of new laws by each successive legislature increases his already heavy burdens.

DISCIPLINE LEADS TO UNITY AND COÖPERATION

Good mine discipline means unity and coöperation on the part of all mine workers, and to secure this it is necessary to overcome the prejudice and jealousy of the more ignorant and bring them to understand that the foreman is acting solely in the interest of safety and as the requirements of his position demand. The writer of Letter No. 3 says, "They [miners of this class] are prone to regard all such requirements as so many oppressions forced upon them and favoring those above them." But the intelligent miner understands the absolute necessity of the mine foreman's enforcing the law and maintaining discipline. Men of this kind can be used to advantage in overcoming the scruples and prejudices of others whose disposition is to disregard all rules and instructions.

There is no question but that operators and miners of the better class are vitally interested in every effort made to prevent accidents—the former because it affects their pocketbooks and the latter because it safeguards them against injury or death.

I have often thought that a good plan to adopt would be for the superintendent and mine foreman to meet a committee of miners to confer with them and decide upon a set of rules and regulations that they consider best adapted for the mine in which they are employed. It would be necessary that such rules and regulations do not conflict with the mining law of the state and that they be approved by the mine inspector of the district. Conditions are likely to arise in any mine that are not covered by the mining law, and in this case it is difficult for the foreman to maintain the same standard of discipline that would otherwise be possible.

I would suggest that in every mine a safety-first committee should be chosen by the miners and appointed to work in coöperation with the mine officials for the purpose of securing a more strict compliance with the mine rules and regulations, and that there should be some penalty or fine imposed for violations. The proceeds resulting from such fines could be given to some hospital or devoted to other charitable work in the community. I believe that in this way all miners would be made to realize that these measures are for their protection, especially if the miners by their committee had helped to formulate the rules. If their coöperation was secured in this manner it would go far toward reducing accidents in mines to a minimum and the idea of safety first would be realized more effectually. MINER.

Steel, Ohio.

The Miner and "Safety First"

Letter No. 3—I have just been reading Miners' Circular 21 issued by the Bureau of Mines and entitled "What a Miner Can Do to Prevent Explosions of Gas and of Coal Dust." In stating the precautions to be taken in a gaseous mine, page 10, the author of this circular says, "Watch to see that ventilation stoppings are tight, and don't grudge a few minutes of your own time in order to close any holes; it is for your safety as well as that of others."

When reading this statement I couldn't help but wonder if the writer had ever worked for his daily bread in a mine. I concluded that if he had he would realize better the conditions under which many miners are compelled to work at the risk of their lives. He would know that in some cases, in nongaseous mines, it is true, as many as three breakthroughs are open in a room at one time, and it is difficult to get any air at the face where the miner must work. At other times the breakthroughs will be only partially closed with old rotten canvas. I have known the air to be short-circuited on this account from 75 to 100 yd. from the working face of an entry where six men were working beyond the air.

Under these conditions, if complaint is made to the foreman on his rounds, he will explain that "it needs

a little bit of canvas down there." But the chances are that there is no canvas to be had at the mine. This may happen, perhaps to a lesser extent, in a mine generating gas in such quantity at the face that when ignited with an open lamp it will continue to burn at the mouth of a drillhole or in a crevice of the coal or a slip in the rock. The foreman will probably say, "That is just a little gas coming off the roll you are crossing." Many times the air current passing such a place and charged with gas, instead of being directed at once into the main-return airway, is carried through other places and permitted to pass into the rise workings. This is done to to save the expense of putting in a box to overcast the air and conduct it into the return.

There are other troubles with gas that compel the miner to run many risks in his daily work. The sump may be permitted to overflow and flood the dip workings, and the men in that section must either work in water or quit. Again, the mine inspector recommends the use of permissible powder, but there is nothing but black powder to be had at the mine. The superintendent will claim, "There is no danger in firing a shot with black powder and a squib, even where you can light the gas in the hole with a lamp." Again, how often it is the case that no proper escapeways are provided for the miners trapped in certain sections of the mine.

Only the miner who experiences these risks every day of his life realizes the difficulties of the situation. It is said that one should notify the inspector when the air is not kept up to the face; but it must be remembered that this requires the signatures of 10 men, and before these can be secured someone is likely to notify the superintendent, with the result that it will be necessary for the miner to look for another place.

Bolivar, Penn. A MINER.

Letter No. 4—The fact is generally recognized that in order to insure the success of the "safety first" movement the strictest discipline should be maintained at all times in the mine and to accomplish this the foreman and his assistants should set the example and enforce all rules and regulations adopted by the company. Any violation of these rules should meet with a reprimand or the instant discharge of the guilty one, whether the act was intentional or performed absentmindedly.

It is indeed unfortunate when a mine foreman or one of his assistants, as occasionally happens, is forgetful or negligent and commits the same act for which he imposed the penalty of "three days off" not long before on one of the miners or company hands. This happened in one of the mines of a large company where I was employed and officials of which always pointed with pride to their "safety-first" methods.

The incident I am about to narrate occurred at 4:40 o'clock one afternoon, just before quitting time. The men were calling their peg numbers and crowding to the foot of the shaft ready to be hoisted to the surface. The foreman of the mine, anxious to get to the bottom of the shaft, climbed between the cars while they were in motion. His act was a direct violation of the company's strictest rules and was performed in plain view of a hundred or more of the mine employees. One of the miners, following the foreman's example, proceeded to do the same thing, for which the foreman promptly gave him three days off to consider his act.

Another case, which attracted my attention strongly, occurred in a mine where the use of open or naked lamps was absolutely prohibited. Everyone entering the mine was compelled to use either a safety or an electric lamp. The drivers, runners, doorboys and company laborers all used Clanny lamps, while miners and their laborers used Davy lamps. The timbermen, bratticemen and tracklayers used electric lamps, which was a precaution taken as a safety movement in the prevention of fire.

SAFETY REGULATIONS INCOMPLETE

Now compare these regulations made and enforced in the interest of safety with the lack of further rules and precautions that were absolutely necessary to safeguard the mine and make the rules adopted of any practical value and effect. For example, none of the safety lamps, which were given off at the head of the shaft, were locked or sealed. There was no rule prohibiting smoking in the mine, and no effort was made to prevent men taking matches into the mine concealed on their person. If a miner got in the dark, there was nothing to prevent him from opening and relighting his lamp, and perhaps throwing the lighted match in the gob, where it might ignite a feeder of gas and cause a disastrous fire and loss of life, or the opening of the lamp might ignite gas accumulated in the place.

There was but one night fireboss, whose sole duties required him only to visit the men working on the night shift. It is easy to see that a small feeder of gas ignited accidentally by the day shift could burn all night and start a fire in the coal that would be difficult to extinguish when discovered by the fireboss on his morning rounds. For this shortsightedness on the part of the company, in attempting to save the expense of a night fireboss to examine for possible fires started by the day shift when leaving the mine, they will perhaps pay dearly some day.

In addition to the points I have mentioned it was possible to find danger lurking everywhere in this mine, as there was loose rock at different points on the main-haulage road, unprotected trolley wires where men and animals must cross the road, and insufficient clearance in many places where the track was laid close to the rib. Certainly it is not always the company that makes the biggest hue and cry in regard to "safety-first" methods above and below ground that carries out the idea in every respect in the mine. Verily there is room for improvement in the mine I have mentioned.

Wilkes-Barre, Penn. CLOSE OBSERVER.

Workmen's Compensation Law

Letter No. 2—The question may well be asked, Why has the recent adoption of the new liability or workmen's compensation law in Pennsylvania caused such a furor? The reason is plain and is found in the fact that so-called experts have surfeited the public with their views and that newspapers, out of deference to these opinions and fearing to tread on strange ground, have lent their opposition to the scheme.

While the columns of technical journals such as *Coal Age* have been open to the discussion of the project, there has been as yet a certain hesitation manifest in its treatment. Mine officials have had little to say, but have acted promptly in preparing to meet the requirements

of the new law. And finally, while state officials very properly refuse to commit themselves, their subordinates have let it be known that the department is not disposed to act in competition with the many insurance companies or mutual associations organized and operating in the state.

In a few cases these organizations have striven to show that the state cannot rightfully conduct a business of insuring against liability. The great army of workers have however, for the most part, submitted quietly to the situation, although an occasional objection is heard to the effect, "When we get old we can find no work, so what good is it?"

Active Opposition Campaign To Defeat the Operation of the New Law

From the first inception of the workmen's compensation idea there has been an active campaign against its adoption. That this has borne results is shown by the fact that many municipalities have voted to give their liability business to stock companies rather than to the state. This lack of coöperation in support of the state law, by municipal authorities, who form an integral part of the state, is designed to make the state law a failure and renders the chances of its success doubtful. It is to be observed, however, that those responsible for the hue and cry against this form of protection are chiefly the paid agents who have assumed greater license than their employers intended. This license will eventually be curtailed, since the employers themselves are accepting the law, thereby showing not only sound reasoning, but good business sense.

The law is clear and plain; it embraces no hidden element that would make its operation uncertain. In fact, the actual conditions in mining afford no greater hazard in estimating a just rate of insurance than is presented in the ordinary life policy issued under different forms by these companies today. It is no fault of labor that large insurance companies have failed to keep pace with economic exigencies, while other corporations have foreseen the development and voluntarily adopted certain pension plans or dividend-sharing and stock systems. This, in my opinion, is the strongest warrant of justification for the new law.

Does the Law Tend Toward Socialism?

The criticism has been made that "such legislation savors too much of a socialistic policy." Socialism is a much-abused term. As interpreted by different men, the term describes what meets with the approval of one and the disapproval of another. But if this so-called "socialism" will remove the scale from the eyes of corporations and abate many abuses in mining regions, it will prove a beneficent act. The providing of adequate protection for workmen against the ills and misfortunes incident to their occupation embraces nothing contrary to Christian doctrine, as has been claimed by opponents of the new law, which is worthy of the most diligent and earnest support of those charged with its execution.

As I have mentioned, it is argued that the state cannot engage in a purely business proposition. It is a fact, however, that signal failures in this direction are more due to the individual cupidity or incapacity of officials than to state proprietorship. The great truths furnished by experience cannot be set aside by specious arguments. We find, even with legal restrictions, corporations are constantly driving bargains that are harmful to society and opposed to public safety. I want to say that the fact that the state enters a business deal does not mean the curtailment of private effort, but on the contrary, it serves to stimulate such effort and insure for it greater success. What is needed is simple honesty and unreserved candor to supplant the politician and professional charlatan. I am glad to say that this great truth is being recognized more fully today than ever before by the leading spirits of our mining corporations. The tendency now is to deal frankly with men and carefully consider their measures, candidly admitting what is fact and facing all situations with a clear conscience. A number of instances might be cited to show that this is the present policy of many large mining corporations.

W. E. Joyce.

Sandy Run, Penn.

Courage vs. Worth in Gaining Desired Promotion

Letter No. 1—The brief reference of William Jardine, *Coal Age*, Dec. 18, p. 1003, calls to my mind several instances that illustrate the point he mentions in respect to the two kinds of courage manifest in the industrious plodder, on the one hand, and the bold, reckless schemer, on the other. While I must agree that the man of the latter type generally forges his way to the front rank, I have observed numerous instances when the earnest, painstaking work of his side partner has been largely, or it may be wholly, responsible for his rapid advancement.

It is worthy of note that these two types of courage in men are animated by quite different purposes. The one acts on the principle of doing the square thing by his fellow man, while the other is wholly absorbed in his own selfish interests and is practiced in blowing his own horn. He is bent on accomplishing his ends regardless of the cost to others.

Promotion Result of Faithful Subordinates

We have all observed cases where mine foremen of moderate ability have been advanced to positions of honor and trust when, as a matter of fact, the credit for their success is practically all due to the faithful services rendered by their subordinates, all of whom may belong to that class of industrious plodders whose labors are too often forgotten, though they have formed the basis of the success of the man higher up.

It frequently happens that among these subordinates, all of whom are ambitious, one will see another promoted to a higher position when he is satisfied that he is himself capable in every way of filling the place. He may reason to himself that he should have got the promotion instead of his fellow, but a little sober thought will reveal to him the reason of the other's success. He finds that he, himself has made no effort to acquaint the "big boss" with his own special capabilities, while the other man has sought and taken opportunities to bring his qualifications to the attention of that official.

It may be that, owing to a certain indescribable prejudice, a man's own boss has not recommended him for promotion, feeling that it would hardly be the sensible thing on his part to advance such one to a position where his special abilities might interfere with his own chances of promotion. He recognizes that the slow but intelligent

courage of the plodder may assert itself in a way he would not desire. This boss reasons to himself that the man is valuable in the position he now occupies. His work is always kept thoroughly in hand, and when the occasion arises requiring intelligent thought and action, he is there on the job. On such occasions his suggestions are good, and he takes his place in the front rank in a natural way. Indeed, the boss would be quite lost without this man on whom he has learned to depend.

One prominent feature of this class of workers is that they can nearly always tell where to find a pair of fishplates in a hurry, or a ratchet jack, or a few pieces of tee-iron needed in case of a wreck on the road, or a No. 0000 line switch that is not in use, or in fact almost anything one may wish to know in connection with the work in his section of the mine. Moreover, this man is known to have a great influence over the men in his charge. Too often we find that such men stay at the bottom and rightly so, because they are better adapted for the work committed to them than they are to fill a position higher up, where the responsibilities are varied and of a different nature. On the other hand, the bold, reckless type is composed chiefly of men whose qualifications enable them to fill almost any position.

Meadowlands, Penn. DANIEL MCKAY.

Paying for the Mining of Coal

Letter No. 2—The writer of the editorial entitled "Wage by Ton and by Hour," *Coal Age*, Jan. 22, p. 172, in attempting to explain the application of his theory to practical mine work, assumes a condition that is illogical because it does not exist. In effect, he asks, Why make improvements designed to lighten the work of handling the output of coal "if the workman demanded his dime anyway"? It is a recognized fact that no class of labor has ever successfully opposed the introduction of labor-saving machinery.

The reference is further illogical, because of the fact that a contract price is no longer binding when the conditions of the contract are changed or the work is performed by the use of improved equipment. Suppose, for example, a timberman unloads 25 tons of coal per day by manual labor, thereby earning under the contract $2.50 a day. The introduction of certain mechanical devices would enable him to unload, say 1,000 tons a day. But he could not then expect to receive the same contract price, which would rightly be reduced to, say, ¼c. per ton, giving him thus a daily wage of $2.50 a day, as before. Or, owing to the improved equipment, requiring a less exertion on the part of the tippleman, the wages paid may be reduced to $2 per day, which means a saving in operating expenses, by reason of the improved equipment, of 50c. per ton per day.

ARGUMENTS AGAINST ADOPTION OF A MINIMUM DAY WAGE IN COAL MINING

There is another side to this question, however. Delays are liable to occur, and when these amount to 2 hr. in an 8-hr. day, the operator loses all he has gained by the improved equipment. Moreover, the day wage generally means a loss of personal interest on the part of the worker, which entails an additional expense for supervision and again reduces the gain to be derived from improved equipment. The same argument will apply to the work of the miner at the coal face, where the most rigid supervision would not make up for the deficiency.

In his first editorial, *Coal Age*, Nov. 20, p. 848, entitled "Paying Mine Workers Both for Time and for Output," the writer made the statement that "a minimum wage plus a lower rate of remuneration per ton of output is the logical way to pay for every operation around the mine." Replying to this argument, in my previous letter, Jan. 8, p. 91, I gave, as a primary object of a minimum wage, the necessity of providing against abnormal conditions such as are liable to occur in the mining of coal. I want to emphasize here the fact that the proposed minimum wage would operate to exclude a certain class of workers who are physically unable to perform the work required of them to earn that amount, which reason will appeal to many as a sufficient argument against its adoption.

I do not wonder that this suggestion was opposed "with force and ability" by Messrs. McKinley, Keely and Virgin at the West Virginia Coal Mining Institute meeting, though the grounds of their opposition are not stated. In his first editorial, page 849, the writer clearly pronounces the contract price "a stumbling block to economy," because the daily wage is a means of "enabling the workman to do a large day's work . . . for less money." To my mind these two quotations are the key to the whole situation and expose the fallacy of the theory of this suggestion to replace the tonnage basis by a daily wage.

PAYMENT ON TONNAGE BASIS PRACTICABLE

While the tonnage basis of payment affords the miner the opportunity to develop his full capacity for work and enables him to determine his own income on an equitable basis, the daily wage suggestion would concede to the operator the power to dictate the earning capacity of his employee, and this dictation would depend on the integrity, honesty and judgment of the employer. Thus labor would be enslaved. On the other hand, were labor sufficiently powerful to dictate the daily wage, capital would be crushed. Neither of these conditions is desirable, but the interests of both employer and employee can be best served by the ton-rate basis of pay, which should be fixed by mutual agreement. The employer would then pay only for work done and the miner would receive compensation only for value produced. As a result, supervision would be practically eliminated and personal interest, which is the greatest factor in efficiency, would be developed.

The editorial to which I have referred, page 172, concludes: "The miner working by the ton has largely placed himself outside the pale of the interest of the operator. Most mine operators, hard pressed by competition, can do little or nothing out of pure philanthropy." I cannot believe that the editorial writer would, as this statement seems to imply, impute the philanthropy of coal operators to motives of self-interest. I understand philanthropy to mean good-will toward men, and a philanthropist to be one who loves and serves his fellowmen. To my mind, philanthropy in business is an unknown quantity. Business is not a matter of sentiment, while philanthropy is based solely on that element. Perhaps the word "policy" should have been substituted for philanthropy in the statement quoted. A. M. INER.

——, Penn.

Inquiries of General Interest

Heat Value of Coal

Kindly explain the difference between the meaning of the expressions, "B.t.u. per pound of coal" and "B.t.u. per pound of combustible." In a table giving the calorific power of different coals, to which I have referred recently, the heat value of the coal is given separately in each of these terms.

Also, can you give me the formula for calculating the B.t.u. per pound of coal and explain its use? I want to calculate the weight of coal having a heat value of 14,450 B.t.u. required to raise the temperature of a boiler containing 5,000 gal. of water from 40 deg. to 85 deg. F., disregarding the unavoidable losses of heat in burning the coal in the furnace. STUDENT.

Johnstown, Penn.

All coal contains a certain weight of incombustible matter, which consists of the moisture in the coal and the impurities forming the ash. The burning of a given pound of coal develops a number of heat units (B.t.u.), which is the heat value given in the table as B.t.u. per pound of coal. Now, it is evident that in a pound of coal there is less than 1 lb. of combustible matter. Therefore the heat value per pound of combustible will always be greater than the heat value per pound of coal. For example, if a coal, containing 90 per cent. of combustible matter, has a heat value of 13,500 B.t.u. per pound of coal the heat value per pound of combustible will be 13,500 ÷ 0.90 = 15,000 B.t.u.

It should be clear that the heat developed by the combustion is thus referred to either one of two standards. The heat value per pound of coal burned is convenient for general use, while that per pound of combustible is employed when making comparative boiler tests or determining the relative value of fuels. Practically, the weight of combustible is equal to the weight of the coal, less that of the moisture and ash and any incombustible gases it may contain.

The formula most commonly used for calculating the heat value of coal from its analysis is that of Dulong, revised by adding 40 B.t.u. for each per cent. of sulphur present in the coal, as explained in *Coal Age,* Vol. 6, p. 765, and is as follows:

$$B.t.u. = 146C + 620\left(H - \frac{O}{8}\right) + 40S$$

In this formula, C is the percentage of fixed carbon, H the percentage of hydrogen, O that of oxygen and S that of sulphur in the coal, as determined by its ultimate analysis. The heat thus calculated is the heat (B.t.u.) per pound of coal and must be divided by the percentage of combustible matter expressed decimally, in order to find the heat per pound of combustible.

For example, the ultimate analysis of a sample of coal taken from the Ferndale mine, Johnstown, Penn., is given in the Bureau of Mines Bulletin 22, Part I, p. 157, as follows: Carbon 76.48%; hydrogen, 4.29%; oxygen, 4.34%; nitrogen, 1.22%; sulphur, 2.42%; ash, 11.25%. The heat value per pound of coal, as calculated by the Dulong formula, is therefore

$$B.t.u. = 146(76.48) + 620\left(4.29 - \frac{4.34}{8}\right) + 40(2.42)$$
$$= 13{,}587 \ B.t.u.$$

The percentage of combustible in this coal is the sum of the percentages of fixed carbon and volatile matter which in this case is given as 85.93 per cent. Hence, the heat value per pound of combustible, in this case, is 13,587 ÷ 0.8593 = 15,811 B.t.u. The heat determined by experiment, as given in the bulletin, is 13,469 B.t.u.

The weight of 5,000 gal. of water is 5,000 × 8⅓ = 41,666⅔ lb. The heat required to raise the temperature of this water from 40 deg. to 85 deg. F. is therefore 44,666⅔ × 45 = 1,875,000 B.t.u. The weight of coal having a heat value of 14,450 B.t.u. per lb. required for this work is therefore 1,875,000 ÷ 14,450 = say 130 lb.

Effect of Complete Saturation on Explosion of Firedamp

A question has arisen here in regard to the effect of complete saturation taking place in an undersaturated air current that is charged with gas to the explosive point. The question is, Would a partly saturated air current charged to the explosive point with gas be rendered less explosive upon becoming completely saturated with moisture, or would the increase of moisture in the air render the mixture more readily ignitible or more violently explosive? We would be glad to see this question answered in *Coal Age.* ANDREW C. BOYD.

Herminie, Penn.

This question is best answered by quoting from "Mine Gases and Explosions," Beard, page 206, which states as follows:

"It is pure speculation at present to assert that a saturated condition of the mine air, other things being equal, will reduce its explosive condition to a minimum. This has not been proved but rather disproved by experiment (Art. 139) and by explosions that have taken place in very wet mines."

The reference to Art. 139, speaking of the experiments performed by Inspector of Mines Henry Hall, Liverpool District, England, says (page 193): "Some of the most violent explosions Mr. Hall obtained occurred when rain had been falling nearly all the day and the air lacked but 0.6 gr. of saturation, the temperature being 52 deg. F. The moisture in the air was therefore 87 per cent. of the amount required for saturation. The flame of the explosion in this case was projected 60 ft. into the air, above the top of the shaft."

From these citations it would appear that the complete saturation of mine air already charged to the explosive point increases the force of the explosion should one occur, but may not accelerate ignition.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—What are the essential features to be observed in building and maintaining roads to secure the safe, speedy and economical handling of coal?

Ans.—Haulage roads in mines should be laid with a grade of from 1 to 1½ per cent. in favor of the loaded cars whenever possible. This feature should be considered in the early laying out of the mine in order to insure the most economical results in the haulage of the coal, whatever system is employed. All roads should be thoroughly drained by ditching the side of the road when this is necessary. The roads should be laid out as straight as possible, and sharp bends should be avoided at the mouth of the cross-entries by giving the matter attention when the entries are turned. The roadbeds should be properly ballasted and the track aligned and brought to grade.

The weight of iron used in laying the track should be adapted to the kind of haulage employed. There is no economy in laying too light iron. A safe rule is to make the weight of iron, in pounds per yard, 10 times the weight of a loaded car, in tons, in mule haulage, increasing this by 2 or 3 per cent. for rope haulage. In motor haulage the weight of iron (pounds per yard) should be from 10 to 16 times the weight, in tons, on a single driver. Thus for a 5-ton locomotive with four drivers, 16-lb. iron should be used, while for a 24-ton locomotive with six drivers, 40-lb. iron would be required.

Another important feature in trackwork is that of giving the outer rail on a curve a suitable elevation above the inner rail to overcome the effect of the centrifugal force developed when the loaded cars are rounding the curve.

Ques.—What is meant by a "double timber set?"

Ans.—A double timber set in coal mining consists of a cross-bar or collar supported on two posts or legs, which are given a slight inclination inward or toward the center.

Ques.—What is meant by "systematic timbering" in mining?

Ans.—Any uniform system of setting post timber at the face of a room, or the coal face in longwall working, is called "systematic timbering." The posts are generally set in two or more rows parallel to the face and spaced at equal distances apart.

Ques.—A drillhole shows coal at a depth of 85 ft., at a distance of 440 ft. east of where the tipple is to be built. In driving a slope from the tipple to the coal, what would be the length of the slope?

Ans.—Assuming a level surface, the distance measured on the slope from the tipple to the bottom of the drillhole will be $\sqrt{440^2 + 85^2} = 448+$ ft.

Ques.—(a) What is a dangerous atmosphere? (b) What is a fatal atmosphere? State fully.

Ans.—(a) In mining practice a dangerous atmosphere is one that is either inflammable, explosive, poisonous, or suffocating and irrespirable. Such atmospheres are dangerous to life because of the result that would follow their accidental ignition or because of the effect they produce on the system when breathed into the lungs. A poisonous or irrespirable atmosphere may impair the health when breathed or be more fatal in its results.

(b) A fatal atmosphere is one capable of producing fatal results when accidentally ignited or breathed into the lungs.

Ques.—If there are 8,500 cu.ft. of marsh gas and air, at its maximum explosive point, passing in an airway, how much air must be added to render this mixture harmless?

Ans.—A mixture of marsh gas and air at its most explosive point may contain 9.46 per cent. of gas. The volume of gas present in this case is therefore $8{,}500 \times 0.0946 = 804+$ cu.ft. per min. passing in the airway. The question of rendering this mixture harmless will depend on the conditions in the mine with respect to the fineness and inflammability of the coal and the quantity of dust floating in the air current. While in the mining of anthracite coal 2 per cent. of gas in the air current is harmless, in the mining of soft coal that is more or less inflammable there should be somewhat less than 1 per cent. of gas contained in the current to render the latter harmless.

Assuming, therefore, that the volume of gas present in this case (804 cu.ft. per min.) is 1 per cent. of the entire current after the air has been added, the volume of air and gas passing would then be $804 \div 0.01 = 80{,}400$ cu.ft. per min. The quantity of air that must be added to give this volume is therefore $80{,}400 - 8{,}500 = 71{,}900$ cu.ft. per min.

Ques.—How many tons in a 10-acre block of coal 6 ft. in thickness, assuming there are 27 cu.ft. of coal in a ton?

Ans.—There are 43,560 sq.ft. in an acre. The cubical contents of a 10-acre tract of coal 6 ft. thick is therefore $43{,}560 \times 10 \times 6 = 2{,}613{,}600$ cu.ft. Then, allowing 27 cu.ft. per ton of coal, the weight of coal in this acreage is $2{,}613{,}600 \div 27 = 96{,}800$ tons.

Ques.—Which do you prefer, an inside-packed pump or an outside-packed pump, and why?

Ans.—An outside-packed pump is generally to be preferred, because the packing can be more readily replaced when worn and the leaking of the same is plainly observable in this type of pump.

Ques.—What is "priming" in a boiler and how does it differ from "foaming"? Give the cause of each.

Ans.—"Priming," in boiler practice, is the passing over of water from the boiler into the steam cylinder of the engine. "Foaming" in a boiler, as the term clearly implies, is the foaming of the water caused by the too profuse bubbling of the steam generated in its mass. Foaming may occur as the result of forcing a boiler, but is more frequently due to the presence of impurities in the water, which gives greater cohesiveness to the liquid and assists the formation of bubbles. "Priming" is the result of excessive foaming or poor design of the boiler

Coal and Coke News

Harrisburg, Penn.

Because the explosion at No. 2 mine of the Jefferson & Clearfield Coal and Iron Co. at Ernest, Indiana County on Feb. 11, is the largest industrial accident, occuring in the state since the enactment of the workmen's compensation law, there is much interest throughout the commonwealth as to the operation of the new law in this case. Like other large employers of labor, the company had taken exceptions under the act and carried its own insurance. The compensation alloted by this act is, therefore, payable to the dependents of the men killed, 27 having lost their lives, and is to commence at once.

The act says, in case of death the workmen's earnings for six months prior to the accident shall be computed and his average weekly pay thus determined. If a man is married his widow is to receive 60 per cent. of what his average weekly wage had been, this to continue for 300 weeks. At the expiration of 300 weeks, and if there are as many as four children, the family is to receive 60 per cent. of the average weekly wage until the youngest child has reached the age of 16 years; if three children, 55 per cent.; if two children, 50 per cent.; and one child, 45 per cent. If the widow marries she forefeits her claim to share in the compensation, which goes to the children according to the foregoing schedule, except that 5 per cent. is deducted because the widow is no longer considered a dependent. In case of injuries 50 per cent. of the average wage is paid to the injured man, which payment is limited to 400 weeks, or a total payment of $4,000.

Henry I. Wilson, of Big Run, member of the Assembly from Jefferson County, is in charge of the compensation work in the present disaster, but has not yet placed an approximate figure as to the amount to be paid in compensation. More than 50 children were left fatherless by the explosion and the cost to the company will hardly be less than $60,000.

Ship Repairs are Authorized

The directors of the Lehigh Valley R.R. on Feb. 17, authorized the expenditure of about $25,000 to repair the Great Lakes fleet of this railroad, which was operated by the Lehigh Valley Transportation Co. It was announced that the ship company, despite the decision of the Interstate Commerce Commission divorcing all ship lines from railroads, would be ready for 1916 business in April.

This step followed the victory of the Lehigh Valley in obtaining a temporary injunction on Feb. 12 in the United States District Court restraining the commission from carrying out its order against the Lehigh Valley. The argument to make the injunction permanent comes up on Mar. 17, and it is the belief of the Lehigh Valley officials that a permanent injunction will follow.

There has been no disposition on the part of other railroads owning lake fleets to contest the commission's interpretation of the Panama Canal act.

PENNSYLVANIA

Anthracite

Hazleton—The Lehigh Valley Coal Co. is experimenting with the use of automobile busses for the transportation of employees whose homes are distant from the mines. Many hundreds of the workers live several miles from the mines and the present method of traveling by teams and trolley is at times uncertain. The experiment is being watched with interest by other mining companies with the idea if it proves a success of adopting the same system for their own employees.

Lansford—In order to increase the tonnage via canal, the Lehigh Coal and Navigation Co. is having constructed 12 new canal boats, which are to be ready in time for the spring trade.

Coaldale—Because the workmen's compensation law does not benefit employees unless their injuries prevent them from returning to work within two weeks after the accident, the locals throughout the Panther Creek Valley propose to assess each member 10c. a week so that injured men will receive $10 a week from the day of the accident.

Shamokin—In a decision handed down on Feb. 16, Charles O'Neill, umpire of the anthracite conciliation board, ruled that mischievous breaker boys discharged for violation of the rules have no standing before the peace body. The case involved the grievance of James McKelvie against the Summit Branch Mining Co. and alleged unjust suspension.

Wilkes-Barre—As a result of the fatal explosion of gas in Prospect Colliery, Lehigh Valley Coal Co., in which 13 men and boys were killed, five damage suits, demanding a total of $100,000, were filed recently by widows and parents of the victims. The plaintiffs ask $20,000 in each of the five cases filed. They are all aliens and bring the suit with the approval of the Austrian consul.

Bituminous

Somerset—During the year 1915, the production of coal in the 20th Bituminous District increased 66,053 tons over 1914, according to the report of Mine Inspector F. W. Cunningham. The total production for 1915 was 5,626,093 tons. Last year it cost a human life to mine every 152,057 tons. The output in proportion to lives lost was reduced by the Boswell explosion, in which there were 19 fatalities.

Indiana—The mines of the Jefferson & Clearfield Coal and Iron Co. are to resume work after having suspended operations since the explosion in the Ernest No. 2 mine, on Feb. 11. The verdict of the coroner's jury and the report of the State Mine Inspectors in the case are that the accident was caused by gas developing from falls, which was ignited by open lights used by some of the miners. The inspectors say that the officials are not to blame in any way, but they recommend that safety lamps be used entirely in the mine.

Kittanning—Two men entombed by a fall of slate in the mine of the Buffalo, Rochester & Pittsburgh Coal Co.'s Sagamore mine were found, on Feb. 16, to be dead when rescuers, after working all night clearing away tons of débris, reached the spot where the men were last seen. One miner who was with the dead men at the time of the accident saved his life by tunneling his way to safety.

Curtisville—A general increase of pay has been offered the miners of the Ford Collieries Co., where a strike was started on Feb. 7 by 900 miners, who demanded a decrease in the price of powder. The demand for a reduction from 8c. to 5c. a stick for powder sold to the miners could not be met by the company, the officials say, but instead a wage increase amounting to about 7 per cent. was given in all classes of work.

Johnstown—Coal operators of this section held a meeting on Feb. 15 to discuss a system by which lower compensation insurance rates could be secured. Safety methods were extensively discussed.

One man out of every 364 employed in and around the coal mines of the 10th Bituminous District, which includes Blair and part of Cambria Counties, was killed last year, and one out of every 103 was injured, according to the report of Mine Inspector Joseph Williams. There were 15 killed and 53 injured, or one fatal accident to every 242,375 tons of coal mined. The total production was 3,638,630 tons of coal.

Connellsville—The production of coke for the week ending Feb. 12 was 441,309 tons, being an increase from the previous week of 8,127 tons. A poor car supply affected the production adversely, while some stock was put on the yards.

Pittsburgh—One of the most important coal land transfers between independent companies recently took place when the Hazel mine, formerly owned by the Pittsburgh-Buffalo Co., was transferred to the Chartiers Creek Coal Co. The price quoted was approximately $500,000. This mine, which lies north of Cannonsburg, and is the largest in that region, produces gas coal to the amount of approximately 600,000 tons per year. Yet it is understood that the Chartiers Company contemplates the purchase of other lands in Allegheny and adjacent counties, and is expected to occupy a conspicuous place in the local industrial field.

Washington—It is announced by the National Mining Co. that one of the largest coal mines in Washington County will be open soon. The mine will be located in Cecil Township, and will employ about 500 men. The National Mining Co. owns about 5,000 acres in this vicinity.

WEST VIRGINIA

Thomas—After being out for more than a week, the miners at 11 mines of the Davis Coal and Coke Co., located at Thomas, Pierce, Francis and Coketon, recently returned to work, having come to an agreement with their employers. An increase of wages both to miners and day men has been granted.

Charlestown—The report of the Mine Department recently made public shows that there were 23 fatal accidents in the West Virginia mining industry during January, 10 of which occurred in McDowell County. During 1915, 496 fatalities occurred in the coal mining industry, of which Fayette County furnished 215. This large number was due to 3 mine explosions at Carlisle, Layland and Boomer, with 22, 111, and 23 fatalities, respectively.

Sutton—The Tioga Lumber Co. recently purchased a considerable quantity of coal on Birch River. This purchase squares up the company's property and gives several miles of river frontage. It is said that the company intends to build a railroad up Birch River and open coal mines and that construction will begin soon if satisfactory traffic arrangements can be entered into with the coal and coke railway.

KENTUCKY

Henderson—After being abandoned for three years, the Spotsville coal mine will resume operations within a few months. This mine was flooded three years ago by water from Green River, and it was believed then that the mine could never be worked again.

Whitesburg—The coal-land litigation of J. Martin Potter against A. B. Potter, the Hamilton Realty Co., and John B. Stephens, for title to Elkhorn coal land valued at half a million dollars, was recently decided in favor of the defendants in a decision in the Letcher County Circuit Court, Special Judge J. R. Layman presiding.

Louisville—The question of jurisdiction between the Kentucky and Tennessee mine-inspection departments has arisen over mines along the border of the two states from the fact that some of the mines have entrances made on the Kentucky side, all the mining operations being carried on under Tennessee soil. The Tennessee mine inspector wishes to inspect them, but has no way of getting underground to do the work except by coming into Kentucky. The matter has been taken up with the Attorney General of Tennessee, who has communicated with Attorney General Logan, of Kentucky, but no decision has been rendered.

OHIO

New Philadelphia—Upon the application of Emery Ankney, manager of the New Philadelphia Coal Mining Co., Prentiss Loomis has been named receiver of the corporation by the Court of Common Pleas. It is claimed that the company is insolvent.

Athens—The business and civic organizations of a dozen towns in this vicinity have filed with the State Public Utilities Commission a joint protest against the prevailing Hocking Valley R.R. rates on coal, setting forth that the present prostrated condition of the coal industry in the Valley is due to inequitable carrying charges. A reduction in rates is asked for the benefit of the industry and the interests depending on it.

Corning—The Corning Coal Co.'s mine, employing about 150 men, and the only operation in this vicinity that has been worked for the past 18 months, has developed a bad gob fire. This fire was discovered recently when the day shift started to work. It originated about 1000 ft. from the entrance and is supposed to have been caused by a short circuit. Two officials were overcome by gas while fighting the fire and the state mine rescue car in charge of Deputy Inspector James Pritchard was called.

Barton—The first coöperative store to be started by the coal miners of Belmont County in compliance with instructions given by district officials at the last convention, was recently opened at Stop No. 19 on the Barton Line. Over 40 miners, including the officials of the district organization are members of the initial venture in coöperative work. It is hoped to enlarge the membership in the near future and to start a chain of stores in various parts of the country.

ILLINOIS

Lebanon—Announcement is made by the People's Coal Co., which has been operating the Lebanon City mine for the past six years under a lease from the Premier Coal and Mining Co., that it will be dissolved Apr. 1, when the present lease expires. Sharp competition and small profits are the reasons given. John Schmidt is president of the company. William Kolb, vice-president of the Premier company, says that if the lease is not renewed the mine will be operated by the Premier company. A movement is talked of to organize a new operating company and take over the mine.

Belleville—W. K. Kavanaugh, president of the Southern Coal, Coke and Mining Co., has issued a statement explaining why the Little Oak mine is not operated. He says it has been closed down because the Little Oak miners have been careless in loading, and mentions that on a certain day a train was delayed because the engine was given dirty coal. A committee of the Little Oak miners has issued a counter statement denying that they are careless and showing that their fines for dirty coal from Apr. 1 to Nov. 30 were less than at the New Baden mine. The train was delayed, they say, because the engine was given a tank of slack instead of good fuel.

O'Fallon—The St. Ellen mine, owned by the Joseph Taylor Coal Co., which recently went into the hands of a receiver, has been opened by the Lumaghi Coal Co., St. Louis and the expectation is that it will be operated steadily until April. It had been closed for some time. The Joseph Taylor mine has been opened by the International Coal and Mining Co. Both mines are on the Baltimore & Ohio Southwestern.

Belleville—The Valley mine, on the Louisville & Nashville R. R., has been leased from the Kolb Coal Co. by the Robert White Coal Co., recently organized. The output of the mine is being handled by the St. Louis Coal Co. Operation of the Royal mine, also on the Louisville & Nashville, has been resumed. The output is being handled by the Bald Eagle Coal Co.

OKLAHOMA

Hartshorne—The Rock Island Coal Mining Co. is arranging for an experiment with a long wall panel system of mining with a mechanical conveyor along the face to the loading chutes. This is something new in this field and will be watched with interest.

PERSONALS

George Watkin Evans, consulting mining engineer of Seattle, Wash., is on a business trip in the East.

George F. McKay, secretary and treasurer of the Otto Coking Co., Inc., No. 6 Church St., New York City, since the organization of that company two years ago, has resigned, effective Mar. 1.

J. E. McCoy was recently re-elected secretary of the Southern Appalachian Coal Operators Association for the ensuing year. Mr. McCoy has served in this capacity since the Association was organized over six years ago.

James J. O'Donnell, sales manager of the Lumaghi Coal Co., will leave that firm Mar. 1 to take a position with the West Virginia Coal Co., with offices in the Victoria Building. Mr. O'Donnell has been with the Lumaghi company 15 years. The name of his successor has not been announced.

E. J. Wallace, formerly St. Louis agent for the Consumers' Fuel Co., who left St. Louis several months ago to enter another line of work at Pittsburgh, has returned and has taken the agency of the Chicago-Carterville Coal Co., with an office at Room 705 Night and Day Bank Building.

Duncan C. Kennedy, for many years connected with the Kanawha Coal Operators' Association, has tendered his resignation to be effective May 1 in order to engage in business for himself. Mr. Kennedy is a former president of the Kanawha District Organization of the United Mine Workers of America.

Frank F. Lyons, superintendent of the Consolidation Coal Co.'s mines at Jenner, Penn., and one of the best known operators in Somerset County, is critically ill at his home. He has been ill for about three weeks and is suffering from a complication of diseases. Mr. Lyons was in charge of the Somerset County interests for the company for some time.

L. W. Brown, superintendent of the Richland Coal Co., of South Warwood, W. Va., recently returned after spending about six months in South America, where he had gone to study the conditions under which men are employed in the different kinds of mines in Peru, Bolivia, Chile, Brazil, Argentine, and Uruguay. Mr. Brown was accompanied on his trip by John C. Berry.

F. R. Leach, director of the Central Purchasing Committee, through which body the city buys its fuel supply for many departments, has announced that he will resign his position as soon as the Civil Service Commission has held an examination and prepared an eligible list from which his successor may be selected. The position pays a salary of $5,000. Mr. Leach will become the controller of E. R. Squibb Co., manufacturing chemists, 80 Beekman St., New York.

OBITUARY

Patrick Berney, who had been suffering from a paralytic stroke for some time died at his home in Tower City, Penn., recently. For about 35 years Mr. Berney was employed by the Philadelphia & Reading Coal and Iron Co. as general inside foreman at its Brookside colliery.

William Jasper Nicolls, for many years prominently identified with the coal business in an engineering capacity died suddenly of apoplexy in Philadelphia recently. Mr. Nicolls was 61 years of age and was born in Camden, N. J. He was a man of versatile talents and in the midst of a busy prefessional career found time to add to the literature of his profession by the publication at the age of 22 years of a book entitled "The Railway Builders." Another book of much interest to the coal trade is known as "The Coal Catechism." He also wrote numerous works of fiction which had an extensive sale. His early education was received at the famous Hill School of Pottstown, Penn. Later he held the position of assistant engineer with the Philadelphia & Reading Ry., from which company he went with the Pennsylvania Steel Co. as chief engineer, and afterward held a similar position with the Long Island Railroad Co. During the last years of his life be conducted an engineering business in Philadelphia. In 1882 Mr. Nicolls was married to Miss Clara Valentine Lyon, of Bellefonte, Penn., who, with a daughter, survive him. He was a member of the Art Club, the Franklin Inn, the Royal Societies, of London, the Stowaways Club, of New York, and the American Society of Civil Engineers.

RECENT COAL AND COKE PATENTS

Miners' Lamp. J. S. Sherman, Staunton, Ill. 1,167,942, Jan. 11, 1916. Serial No. 36,649.

Coke Oven. F. J. Collin, Dortmund, Ger. 1,157,368, Oct. 19, 1915. Filed Feb. 21, 1912. Serial No. 679,068.

Coke Oven. L. L. Summers, Chicago, Ill. 1,155,526, Oct. 5, 1915. Filed May 22, 1914. Serial No. 840,171.

Stoker. G. E. Stevens, Everett, Mass. 1,167,028, Jan. 4, 1916. Filed Apr. 29, 1914. Serial No. 835,331.

Automatic Stoker. A. Cotton, Newark, N. J. 1,167,982, Jan. 11, 1916. Filed May 4, 1910. Serial No. 559,287.

Smoke Consumer. C. E. Anderson, Duluth, Minn. 1,157,661, Oct. 26, 1915. Filed Jan. 5, 1915. Serial No. 707.

Furnace Door. R. C. Sherman, Miles City, Mont. 1,159,282, Nov. 2, 1915. Filed Jan. 4, 1915. Serial No. 421.

Coal Washer. A. F. Blair, Seattle, Wash. 1,158,777, Nov. 2, 1915. Filed June 11, 1913. Serial No. 772,988.

Mining Machine. J. Secrist, Nuttallburg, W. Va. 1,160,660, Nov. 16, 1915. Filed May 6, 1914. Serial No. 836,780.

Smoke Preventer. B. L. Ames, Boston, Mass. 1,166,880, Jan. 4, 1916. Filed Mar. 20, 1914. Serial No. 826,118.

Stoker for Locomotives. A. R. Ayres, Chicago, Ill. 115,264, Oct. 12, 1915. Filed May 26, 1913. Serial No. 769,840.

Smoke Consumer. C. Hocker, Huntingburg, Ind. 1,159,028, Nov. 2, 1915. Filed Apr. 24, 1914. Serial No. 834,196.

Tunnelling Machine. W. E. Dean, Superior, Wis., 1,156,277. Oct. 12, 1915. Filed Sept. 12, 1912. Serial No. 720,077.

Coke Oven Door. M. Cappelli, Washington, Penn. 1,159,827, Nov. 16, 1915. Filed Aug. 30, 1913. Serial No. 787,530.

Coal Mining Machine. J .S. Wallace, Iaeger, W. Va. 1,159,302, Nov. 2, 1915. Filed Aug. 5, 1915. Serial No. 43,856.

Dumping Grate. G. H. Thacher, Jr., Albany, N. Y. 1,158,747, Nov. 2, 1915. Filed Aug. 2, 1912. Serial No. 712,888.

Smoke Stack Attachment. J. T. Sweeney, Chillicothe, Mo. 1,157,060, Oct. 19, 1915. Filed Aug. 8, 1914. Serial No. 855,851.

Coal Separating Machine. W. A. Riley, Wyoming, Penn. 1,161,733, Nov. 23, 1915. Filed June 11, 1915. Serial No. 33,566.

Steam-Boiler Furnace. W. A. Gilchrist, Memphis, Tenn. 1,166,670, Jan. 4, 1916. Filed Apr. 17, 1911. Serial No. 621,726.

Aërator for Coke Ovens. J. B. Keller, Scottdale, Penn. 1,167,901, Jan. 11, 1916. Filed June 20, 1914. Serial No. 846,338.

Mechanical Stoker. F. M. Clark, Garden City, L. I., N. Y. 1,167,627, Jan. 11, 1916. Filed Apr. 14, 1914. Serial No. 831,783.

Automatic Stoker Mechanism. C. D. Young, Pittsburgh, Penn. 1,156,854, Oct. 12, 1915. Filed May 10, 1911. Serial No. 626,376.

Tender Coal Loading Apparatus. H. C. Buchwald. Baltimore, Md. 1,157,366, Oct. 19, 1915. Filed Sept. 30, 1914. Serial No. 846,193.

Manually Operated Mine Door. N. K. Bowman, North Lawrence, Ohio. 1,155,703, Oct. 5, 1915. Filed June 23, 1914. Serial No. 846,828.

Boiler Furnace and Feed Water Heater. J. R. Surrell, New York, N. Y. 1,400,512 Oct. 26, 1915. Filed July 14, 1915. Serial No. 39,932.

Apparatus for the Manufacture of Coke. J. Armstrong, London, Eng. 1,166,422, Jan. 4, 1916. Filed Jan. 22, 1912. Serial No. 672,694.

Apparatus for Coking Coal Briquets. P. Hein, Essen-Rüttenscheid, Ger. 1,155,486, Oct. 5, 1915. Filed June 19, 1914. Serial No. 846,070.

Mine Cage. P. W. Holstein, assignor to Jeffrey Mfg. Co., Columbus, Ohio. 1,168,501, Jan. 18, 1916. Filed Jan. 2, 1908. Serial No. 408,890.

Conveying, Sorting and Screening System. G. Tollefson, Bagley, Minn. 1,159,134, Nov. 2, 1915. Filed June 26, 1913. Serial No. 775,866.

Lamp-Holding Attachment for Miners' Caps. L. M. Ashley, Jr., Winona, W. Va. 1,168,700, Jan. 18, 1916. Filed Mar. 15, 1915. Serial No. 14,511.

Fuel-Saving Attachment for Furnaces. N. J. Russel and C. A. Tyden, Chicago, Ill. 1,167,845, Jan. 11, 1916. Filed June 28, 1915. Serial No. 36,649.

Method of Treating Coal Gas. H. A. Carpenter, assignor to Riter-Conley Manufacturing Co., Pittsburgh, Penn. 1,167,149, Jan. 4, 1916. Filed May 6, 1914.

Drilling Machine. M. W. Sherwood, assignor to Chicago Pneumatic Tool Co., Chicago, Ill. 1,161,259, Nov. 23, 1915. Filed Mar. 12, 1914. Serial No. 824,082.

Water-Tube Steam Boiler. W. A. Moffat, assignor to Erie City Iron Works, Erie, Penn. 1,167,361, Jan. 4, 1916. Filed June 16, 1915. Serial No. 34,500.

Hopper Bottom Car. M. C. Blest, assignor to Pressed Steel Car Co., Pittsburgh, Penn. 1,160,827, Nov. 16, 1915. Filed Mar. 17, 1911. Serial No. 615,083.

Water Tube Boiler. S. Thurstensen, assignor to Henry Vogt Machine Co., Louisville, Ky. 1,157,737, Oct. 26, 1915. Filed July 25, 1914. Serial No. 853,069.

Smoke and Water Tube Boiler. W. Polderman, Jr. and F. H. Luchsinger, Ymuiden, Netherlands. 1,161,726, Nov. 23, 1915. Filed Apr. 12, 1915. Serial No. 20,941.

Miner's Shoe. J. T. Crowley, assignor to Beacon Falls Rubber Shoe Co., Beacon Falls, Conn. 1,155,644, Oct. 5, 1915. Filed Sept. 1, 1914. Serial No. 859,600.

Soot Cleaner for Boilers. F. W. Linaker, assignor to Vulcan Soot Cleaner Co., Pittsburgh, Penn. 1,167,766, Jan. 11, 1916. Filed May 20, 1915. Serial No. 29,336.

Fuel Economizer Soot Cleaner. F. W. Linaker, assignor to Vulcan Soot Cleaner Co., Pittsburgh, Penn. 1,160,729, Nov. 16, 1915. Filed Nov. 3, 1914. Serial No. 870,124.

Mining Machine Chain. C. B. Norris and C. C. Marshall, assignors to Jeffrey Mfg. Co., Columbus, Ohio. 1,159,861, Nov. 9, 1915. Filed Feb. 20, 1909. Serial No. 479,073.

Smoke Consuming Apparatus for Locomotive and Other Boilers. J. E. and W. R. Price, and C. L. Hildreth, Covington, Ky. 1,159,085, Nov. 2, 1915. Filed Nov. 24, 1914. Serial No. 873,819.

Combined Boiler Support and Cinder Chute. B. Jacoby and C. S. Johnson, assignors to Marion Steam Shovel Co., Marion, Ohio. 1,159,497, Nov. 9, 1915. Filed May 29, 1913. Serial No. 770,667.

PUBLICATIONS RECEIVED

Report of the Department of Mines of Kentucky, 1914. Illustrated; 259 pp., 7x10 in.

The Production of Coal in 1914, by C. E. Lesher, Geological Survey, unillustrated, 159 pp., 6x9 in.

Annual Report of the Secretary of Mines of Victoria for the Year 1914. Illustrated; 163 pp., 8x13 in.

The Broad Pass Region, Alaska, by Fred H. Moffit, Geological Survey Bulletin 608, illustrated, 80 pp., 6x9 in.

The Willow Creek District, Alaska, by Stephen R. Capps, Geological Survey Bulletin 607, illustrated, 86 pp., 6x9 in.

The Production of Metals and Ores in 1913 and 1914, by J. P. Dunlop, Geological Survey, unillustrated, 9 pp., 6x9 in.

Coal Mining in Illinois, by S. O. Andros, Illinois Coal Mining Investigations Bulletin 13, illustrated, 250 pp., 6x9 in.

Annual Report of the Department of Public Works of the Province of Alberta, 1914. Unillustrated; 293 pp., 6¾x10 in.

Potash in Certain Copper and Gold Ores, compiled by B. S. Butler, Geological Survey Bulletin 620-J, unillustrated, 9 pp., 6x9 in.

The Ellamar District, Alaska, by S. R. Capps and B. L. Johnson, Geological Survey Bulletin 605, illustrated, 125 pp., 6x9 in.

Electroplating with Cobalt, by Herbert T. Kalmus. Canada Department of Mines, Part 3; illustrated; 69 pp., 6½x9¾ in.

Saving Fuel in Heating a House, by L. P. Breckenridge and S. B. Flagg. Bureau of Mines Technical Paper 97; illustrated, 35 pp., 6x9 in.

Recent Alunite Development near Marysvale and Beaver, Utah, by G. F. Loughlin, Geological Survey Bulletin 620-A, illustrated, 33 pp., 6x9 in.

Surface Water Supply of Oregon, 1878 to 1910, by F. F. Henshaw and H. J. Dean, Geological Survey Water Supply Paper 370, illustrated, 829 pp., 6x9 in.

Twenty-Fourth Annual Report of the Ontario Bureau of Mines, 1915, Part I, printed by order of the Legislative Assembly of Ontario, illustrated, 248 pp., 6½x9½ in.

Influence of Temperature on the Strength of Concrete, by A. B. McDaniel. Engineering Experiment Station, University of Illinois, Bulletin No. 81; illustrated; 24 pp., 6x9 in.

Profile Surveys in Chelan and Methow River Basins, Washington, prepared under the direction of R. B. Marshall, Geological Survey Water Supply Paper 376, 8 pp. and 5 maps, 6x9 in.

Twenty-Fourth Annual Report of the Ontario Bureau of Mines, 1915, Part II, records of wells drilled for oil and gas in Ontario, by Cyril W. Knight, illustrated, 96 pp., 6½x9½ in.

A Bibliography of the Chemistry of Gas Manufacture, by W. F. Rittman and C. M. Whittaker, compiled and arranged by M. S. Howard. Bureau of Mines Technical Paper 120; unillustrated; 29 pp., 6x9 in.

Profile Surveys in 1914 on Middle Fork of Willamette River and White River, Oregon, prepared under the direction of R. B. Marshall. Geological Survey Water Supply Paper 378, 8 pp. and 6 map plates, 6x9 in.

Surface Water Supply of the United States, 1913, Part IV, Hudson Bay Basins and Upper Mississippi River, by Mason C. Grover, W. A. Lamb and W. G. Hoyt. Geological Survey Water paper 355, illustrated, 181 pp., 6x9 in.

Profile Surveys in Spokane River Basin, Washington, and John Gay River Basin, Oregon, prepared under the direction of R. B. Marshall. Geological Survey Water Supply Paper 377, 8 pp. and 10 profile maps, unillustrated, 6x9 in.

Surface Water Supply of the United States in 1913, Part II, South Atlantic and Eastern Gulf of Mexico Basin, by George B. Grover, Guy C. Stevens and Warren E. Hall. Geological Survey Water Supply Paper 352, illustrated, 84 pp., 6x9 in.

Surface Water Supply of the United States 1914, Part VIII, Western Gulf of Mexico Basin, Nathan C. Grover, Chief Hydraulic Engineer, Glenn A. Gray, District Engineer. Geological Survey Water Supply Paper 388, illustrated, 123 pp., 6x9 in.

INDUSTRIAL NEWS

Columbus, Ohio—The offices of the Hisylvania Coal Co. have been moved from the 13th floor to the 12th floor of the Capitol Trust Building in order to get additional room.

St. Louis, Mo.—The agency for the output of the Winkel mine at Winkel, Ill., has been changed from the Bald Eagle Coal Co. to the Granger Coal Co., with offices in the National Bank of Commerce Building.

Philadelphia, Penn.—M. P. Howlett, conducting one of the largest lighterage businesses at this port has added another steam bunker to his fleet, which now numbers seven, each of which has a hoisting crane with a capacity of 100 tons per hour.

Bluefield, W. Va.—The coal shipments over the Norfolk & Western for the month of January amounted to 2,653,409 tons, being an increase of 766,471 tons over January of 1915. Loadings for export were not as brisk as usual, but held up well with the December record.

Norfolk, Va.—The coal tonnage of the Chesapeake & Ohio R.R. for the six months ending Dec. 31, 1915, amounted to 12,870,715 tons as compared with 11,000,347 tons in 1914. For the month of December the company showed an increase of 589,973 tons, with a total of 2,092,141.

Scranton, Penn.—Hugh A. Dawson, representative from the Second Legislative District, recently leased the Marion Coal Co. property at Taylor. It is said that the operation of the property will be started within a week, all details for the preliminary work having already been made.

Philadelphia, Penn.—The Philadelphia & Reading Ry. carried during the year 1915 5,923,905 tons more of bituminous coal than anthracite, this being an increase of 1,669,954, with a total of 17,412,348 tons. The amount of anthracite carried was 11,488,444 being a decrease of slightly over 4% compared with 1914.

Charleston, W. Va.—A fire recently did damage to the extent of about $1,000 at the plant of the Kanawha Mfg. Co., formerly known as the Kanawha Mine Car Co. in the eastern portion of the city. This loss is said to be fully covered by insurance, and only a short time will be lost before business may be resumed.

Beckley, W. Va.—The coal tonnage records of the Chesapeake & Ohio R.R. were broken for the month of January; even the previous banner month of September, 1914, being exceeded by nearly 10,000 tons. The total for January was 2,451,730 tons; this was 617,000 tons better than the corresponding month of last year.

Anchorage, Alaska—It is stated that coal mining has already begun on a commercial scale in Alaska. It is said that John A. Herbert is marketing lignite from the Chugach National Forest near Seldovia. He began operations May 1 last, and has found a ready market at salmon canneries and other points throughout the territory.

Columbus, Ohio—P. A. Coen, general sales manager of the Sunday Creek Coal Co. announces the completion of three modern tipples in the Hocking Valley. They are equipped with modern screens and will be placed in operation as soon as wage and scale matters are adjusted satisfactorily. The tipples are at Mines Nos. 401 and 402 at San Toy and 256 at Glouster.

Lorain, Ohio—It is announced that the United States Steel Corporation will spend $6,000,000 in the improvement of the Lorain plant of the National Tube Co. Furthermore, that a battery of coke ovens will be built for the production of fuel for the blast furnaces. The Tube company now has in process of erection a new blooming mill and eight open hearth furnaces.

Spokane, Wash.—Activity in the mines of the West Kootenai and Boundary districts has so increased the demand for coke that every oven in Fernie, B. C., is running and 200 ovens at Michel, which have been idle for the last three years. The demand for coal has increased greatly during the last few months, and especially by the railroads whose traffic is steadily increasing. Many miners have been enlisted in the cause of Great Britain and this leaves a great scarcity in help.

St. Louis, Mo.—The second annual convention of the Mississippi Valley Terminal League, held here during the past week, took decisive action toward getting a complete chain of terminals along the inland waterway system of the Mississippi Valley. An engineering committee was appointed to study the dock and terminal needs of every city in the valley. It is intended that the terminals shall be uniform, so that loading and unloading of barges will be facilitated. St. Louis is to have a temporary terminal by spring and a permanent one by the following spring.

Cincinnati, Ohio—The announcement was recently made to the effect that the closing negotiations for a large coal mining and transporting merger, which would include the Marmet coal interests, and a number of Ohio river coal-carrying steamer lines, were in the process of making. It is said that $38,000,000 are involved in the territory all lying in the splint coal field of West Virginia, which is now under option. A similar organization attempted some months ago, failed on account of the money market in New York. This obstacle is now said to be entirely removed.

Philadelphia, Penn.—The Joseph H. Reilly Coal Co. has increased its Cambria County holdings by the purchase of 140 acres of coal land from the W. D. Bigler Estate and from the Walnut Run Coal Co. This land adjoins property already owned by the company and brings its total holdings up to 700 acres. The work of opening the property began last summer and it is expected in a short time the company will be making shipments to market. The mechanical equipment is up-to-date in every respect and it is expected when the plant comes into full operation its production will be a large one.

Market Department

General Review

Anthracite slightly easier. Bituminous hinging largely on weather and results of labor conferences. Indications point to higher prices on contracts. Exports lighter. Demand at interior points confined mostly to contracts. Middle west trade continues strong.

Anthracite—The hard-coal market seems to fluctuate directly with weather conditions, another severe cold snap the beginning of this week, having precipitated a further rush for coal. The trade generally, however, seems to be well supplied at most points, and there was little of an urgent character in orders. In directions where embargoes still prevail, the shortage is becoming more or less acute, and operations at some manufacturing plants may be seriously affected unless relief is obtained shortly. The labor situation is becoming a constantly increasing factor, and the agencies are looking forward to a repetition of the heavy rush for coal that marked the expiration of the last agreement in March, 1912.

Bituminous—The market continues very uncertain, and subject entirely to such influences as temperature, car supply at the mines, embargoes at different points, and the progress at the labor conferences. The movement is generally all that could be desired, except to those few points where embargoes are on, but most interests seem to have an adequate supply, and there is an absence of the customary snap that has characterized the recent trade. There is no attempt to force the market as yet, but should there be much further slowing up, it is not improbable that there might be a heavy slump when some of the shippers get uneasy and begin unloading. The situation on new contracts continues indeterminate. It has been positively ascertained that some business has been closed at higher levels than last year, but reports indicate that most of them are being negotiated on the same basis as old contracts plus a small addition to cover increased cost of materials, and embodying a protection against any wage increase.

Exports—The offshore demand apparently continues as heavy as at any time during the boom period of the past several weeks, but the dumpings over the Hampton piers show a very perceptible falling off, due in part to the coal being badly frozen and difficult to handle. Supplies are short, some exporters finding difficulty in obtaining sufficient tonnage to fill out cargoes, and prices have been nominally advanced on this business, though it is doubtful if any sales have yet been negotiated at the new high figures. Exporters continue offering increased freight rates, while the available tonnage is constantly decreasing.

Lake Markets—The extraordinary demand on contracts from the iron and steel industry is the mainstay of this market. The tendency has undoubtedly been toward lower levels, and there is sufficient coal offering in the spot market to affect the price situation and restore approximately normal conditions. Embargoes to the Eastern markets are still generally in effect, but no important demand is to be expected in that direction now, as the trade there is apparently well supplied. The only development of a definite character in the labor outlook is that retailers have apparently accumulated all the reserve stock they expect to for the time being at least. The mild temperatures have interfered with the retail trade, though prices are fairly well maintained.

Middle West—The market continues active with strength centering more particularly on the steam sizes. The uncertainty concerning the results of the labor conferences, together with warm weather, has tendered to create a reactionary tendency, but the recession was on a small scale. Storage operations have been resumed once more and on a larger scale. Much now hinges on the labor conferences, and a number of well informed agencies express the opinion that there will be a cessation of operations for a short period at least. The mild weather caused a direct reversal of conditions at the upper Lake ports and dock operators have been afforded a welcome opportunity for catching up on business accumulated during the past month.

A Year Ago—Anthracite steam sizes moderately active but domestic grades completely demoralized. Bituminous market still crowded with coal. Interest centering on new contracts. Current business continues under heavy pressure.

Business Opinions

Boston News Bureau—While the general outlook is favorable in the main, the war and its consequences naturally make for more or less fear and dread. For this reason caution rules men's operations to a greater degree than one would think possible. Our relations with Germany are not liked. Where all this is drifting us to no one knows. The lack of a strong government operates to cause uneasiness. But in looking beyond the incidents of the day, the situation has its strong side. The war started a veritable boom in the iron and steel trade and in fact in all the metals. Manufacturers are sold ahead so far they are not disposed to accept new orders at reasonable prices. The prosperity of our railroads means that new capital can soon be obtained for new construction.

Iron Age—The Pittsburgh advance of $5 a ton on contract plates, shapes and bars, announced Feb. 18, was quite unexpected even by the selling organizations of the companies making it. There was thus none of the "protection" to large users that has sometimes preceded important advances. Nothing in the remarkable price movement of the past four months has so disturbed buyers or impressed them with the chances of surprise in the whole situation. The considerable amount of capacity in the last half of the year not taken up by contracts at definite prices and the way in which steel companies are fencing against taking on business for such delivery are a little bewildering to buyers. Yet there is no doubt of the increasing tightness of mill schedules.

Bradstreet—All-around activity prevails, the situation in some lines being unparalleled. Buyers throng the leading markets; industry, except in a few negligible instances, continues at full speed; prices with the notable exception of raw cotton, keep on rising; scarcity of numerous articles is more marked than ever, and while high costs under ordinary conditions would tend to automatically restrict consumption, the fact is that at this juncture the advancing levels seem to spur buyers to extraordinary efforts to fill their requirements.

Dun—Accumulation of forward business is only limited by the ability and disposition of manufacturers to further extend commitments. Disproportion between demand and supply—heretofore apparent in comparatively few lines—is spreading, and it is increasingly manifest that productive and distributing facilities have not kept pace with the rapid growth in requirements. Commercial failures this week in the United States are 428, against 408 last week, 469 the preceding week and 664 the corresponding week last year.

Marshall Field & Co.—Current wholesale distribution of dry goods has been in excess of the same period of a year ago. Road sales for immediate delivery have been normal, but much greater for later spring and fall delivery than the corresponding period of a year ago. More customers have been in the market. Collections are normal. Prices are firm.

American Wool and Cotton Reporter—Activity in East India wool, with speculation on the part of a few houses, has been the feature of the wool market for the week under review. The embargo on these wools has been the cause. The situation has had a decidedly strengthening effect on the carpet wool market. Advances of from 2 to 5c. have been made. China wools have advanced 2c. per lb., an increase largely due, it is thought, to higher freight and insurance rates. In the West, wool growers are asking prohibitive prices.

The Southern Lumberman—With the nearer approach of spring and the lessening in the severity of weather conditions over much of the country, particularly in the middle West and South during the last few days, prospects for immediate demand from retail yards for restocking seemed much better than when the East was locked under ice and snow by the recent blizzard. Continuation of demand from the railroads for both car and construction material on a scale even in excess of the present substantial movement, is forecasted by the generally gratifying reports of railway traffic and finance. Hardwood movement during the month of January and the first half of February has steadily expanded. Orders are plentiful, and prices have acquired much additional strength during the past week.

ATLANTIC SEABOARD

BOSTON

Hampton Roads coals firm at $2.85, but no advance in sight. Dispatch continues excellent; demand is spasmodic. Georges Creek again in short supply and the Pennsylvania grades are once more embargoed against New England all-rail points. Anthracite movement again slow.

Bituminous—The continued cold spell gave a little stimulus to the demand in this territory for Pocahontas and New River but only a few scattering sales were made on the market and there was no pronounced inquiry. Prices were unaffected. While $2.85 f.o.b. Hampton Roads is firmly maintained it is next to impossible to realize any higher figure. Dispatch couldn't be better; apparently all interests have ample supplies standing at the piers, and there is a lack of snap to the trade. Not even the prediction that contract prices will be $3 f.o.b. beginning Apr. 1 will induce any buying for the future. On that date so many consumers will be under contract at the low prices made last fall that meanwhile they will take coal very sparingly. Buyers who have not such contracts will also postpone any franchises on the open market on the ground that prices, as well as marine freights, are almost sure to be lower.

At distributing points a settling tendency has been still further in evidence. Except for small lots on short notice, prices are down to the $2.85 basis plus the current water freight, or about $5.35@5.50 on cars at Boston. No large quantities have been available, and such cargoes as arrive are gradually absorbed. Agencies canvassing for new contracts on a basis higher than last year are meeting with very small response. A good deal depends both on the amount of steamer tonnage available after Apr. 1 and on the prices named by Pennsylvania bituminous interests.

While Georges Creek is short again at tidewater points, the shortage is understood to be only temporary. Meanwhile there are occasional clearances of Georges Creek transportation with Pocahontas and New River at Hampton Roads. There is apparently no news with regard to contract prices for next season, that subject waiting somewhat on the straightening out of present difficulties.

Embargoes are again in force in many of the Pennsylvania districts against most of the New England points all-rail. A little spurt on coal in transit has again developed, but so far prices have not materially advanced. Most operators who have been making exertions to fill contracts are now pruning their lists very carefully, cancelling the quotas due consumers during the period embargoes are effective. Little progress has been made on next season business, shippers and buyers being still far apart in their views of a proper season basis. If the present recurrence of congestion all-rail is only a short one it may be that Mar. 15 will see conditions straightened out sufficiently to warrant some discussion of new prices.

Anthracite—Storms and the cold weather have interfered with barge movement and dealers are again anxious over supplies. Broken is very short at all the piers, and stove is once more in light supply. The steam sizes are none too plentiful. At the same time the few cargoes of independent coal that were sent here on speculation have met hard going. Dealers are not at all inclined to pay even water freights from Philadelphia and New York, so long as there is a chance of getting deliveries on the regular circular.

Bituminous prices, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.90@3.65	$3.20@3.80	.....	$1.75@2.40
Cambrias and Somersets	3.00@3.80	3.35@4.00	.....	1.90@2.65
Georges Creek*	2.92@3.02	3.22@3.32	$2.85@3.00	.....

*Contract

Pocahontas and New River are quoted at $2.85 f.o.b. Norfolk and Newport News, Va. On cars at Boston and Providence, Pocahontas and New River are quoted at $5.25@5.50.

NEW YORK

Anthracite trade active. Quick market for loaded bottoms with good prices. Embargoes continue in force. Bituminous situation slow and prices easy. New contracts closed at advance over last year's prices.

Anthracite—There is considerable activity in the anthracite market. Demand has again braced up and dealers report a heavier call. Shippers had trouble the first of the week in getting boats loaded owing to the frozen condition of the coal as a result of the snow, sleet and rain storms. Loaded boats were in demand and owners found an easy market with prices occasionally above the company circular. Retailers were, however, well supplied and there were but few urgent calls to replenish stocks.

The situation at Tidewater is very easy. Premium coals in the prepared sizes have entirely disappeared; all sizes are plentiful and sales of stove below company circular were reported early in the week. Egg and nut are active and pea coal is now going at regular prices. All buckwheat grades are easy and demand has fallen off. Buckwheat No. 3 is reported short at some of the upper ports.

Current quotations, gross tons, f.o.b., Tidewater follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.30@5.30	5.35	$5.35@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.60@5.60
Pea	3.50	3.50@3.50	3.55	3.55@3.55
Buckwheat	2.75	3.00@3.15	2.80	3.05@3.20
Rice	2.25	2.00@2.30	2.30	2.05@2.35
Barley	1.75	1.50@1.80	1.80	1.55@1.85

Bituminous—Demand for bituminous coal at Tidewater continues slow with prices unchanged. Some strength was shown early in the week due to low temperatures and buying improved slightly; loaded bottoms were snapped up rapidly due to the inability of the docks to handle the frozen coal with dispatch. Shippers are not forcing the market but should demand fall off considerably there promises to be a scramble on the part of some to get rid of their holdings.

Harbor shipments were interfered with early this week by ice in the rivers and nearby Sound points. Most of the embargoes remain in force.

Some new contracts are being closed. Some reports are that no prices are below $1.50 at the mines and as a rule range from 25 to 30c. higher than last year. Another report is that some operators are closing new contracts at last year's prices plus the extra cost of materials, the compensation law, and any advance in wages that may be granted to the mine workers in the new agreement.

Tidewater prices for good grades range from $3.25 to $3.50 f.o.b., while alongside quotations for similar grades are from $4 to $4.25.

Average quotations, gross tons, f.o.b., Tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.25@4.50	$4.25@4.50	$4.25@4.50	$2.75@3.00
Georges Creek Tyson	3.50@3.75	3.50@3.75	3.50@3.75	1.95@2.20
Clearfield:				
Medium	3.25@3.50	3.25@3.50	.....	1.70@1.95
Ordinary	3.25@3.50	3.25@3.50	.....	1.70@1.95
Broad Top Mountain				1.70@1.95
Cambria County:				
South Forks	3.50@3.75	.....	.....	1.95@2.20
Nanty Glo	3.35@3.60	.....	.....	1.80@2.05
Barnesboro	3.25@3.50	.....	....	1.70@1.95
Somerset County:				
Quemahoning	.....	3.35@3.60	3.35@3.60	1.80@2.05
Medium	3.25@3.50	3.25@3.50	3.25@3.50	1.70@1.95
Latrobe	3.00@3.25	.....	.....	1.45@1.70
Greensburg	3.25@3.40	.....	.....	1.70@1.85
Westmoreland	3.80@4.00	.....	.....	2.25@2.45
West Virginia Fairmont		3.25@3.40	3.25@3.40	1.45@1.60
Fairmont mine-run		3.25@3.40	3.25@3.40	1.45@1.60
Steam		3.00@3.25	3.00@3.25	1.45@1.70
Western Maryland		3.00@3.25	3.00@3.25	1.45@1.70

PHILADELPHIA

Frigid weather gives a snap to the anthracite. Prices steady on all prepared sizes, with stove the strongest. Orders for pea ahead of deliveries. Bituminous experiences a further decline. Some contract prices out.

Anthracite—A few days of frigid weather caused a sharp spurt in the retail trade which benefited the shippers also. However, the big companies are reaping most of the harvest these days, and the individuals are beginning to complain of a poor month's business when they had expected an unusually good one. They are now looking forward to March and hoping the rush will compare with that of March, 1912, when some records were made that have not since been approached.

As Apr. 1 draws near it is generally agreed by all that some radical changes are at hand, and the retailers show a grim determination to place their business on a firmer basis during the reconstruction period. They insist that they cannot continue with the present small margin of profit and their liberal credit system.

The dealers have been much incensed at the recent publication of the operators' statement to the effect that their margin of profit on a ton of stove coal amounts to $2.15 per ton. It has been pointed out to them by the operators that the price was figured on the New York retail price and plainly stated in the advertisement. However, the dealers still insist that it is misleading, claiming that they have had to meet the criticism of customers almost without number since the publication of the advertisement. On the part of the

dealers there is no doubt that the difference between their cost and selling prices in this district, based on all-rail deliveries, which covers about 90% of the yards is as follows: Egg, $1.45, stove, $1.45, chestnut, $1.55 and pea, $1.30.

All sizes are moving steadily this week. Broken coal at $3.35 on contract has long been oversold, and if the spot tonnage available were greater it could be moved at $3.60 without any difficulty. Egg enjoyed another little spurt during the cold days and is still firm at $3.85. Stove is still quite active and no sales have been made below the circular price of $4.10. This size has not been plentiful with any of the shippers of the better grades. Chestnut holds its own but no more than that, and while the price of $4.25 has not been reduced in any case, it is not at all likely now that the immense amount of this size in storage can be moved before Apr. 1. Pea is most active and the demand far exceeds the supply, although no premiums are being obtained and all grades are bringing the circular price of $2.55. If the shippers can secure the cars there is sure to be an enormous stocking of this size before Apr. 1. The steam grades, with the exception of barley, continue to go forward in large volume, with prices practically unchanged for the past six weeks. Coastwise shipments of anthracite continue with a good tonnage moving, and freights somewhat lower, but with vessels still very scarce.

Prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.85	Pea	$2.55	$3.30
Egg	3.85	5.10	Buckwheat	1.55	2.30
Stove	4.10	5.10	Rice	.90	1.80
Chestnut	4.25	5.35	Barley	.55	1.30

Bituminous—Continued railroad congestion with all embargoes still in force has resulted in a further drop in prices on all grades of from 5c. to 20c. a ton. The car supply is so poor that some operations have been reported closed for a day or two at a time. The weather, too, has been anything but favorable to the trade. While very few contracts have been closed, some that have been taken at $1.75 at the mines without protection to cover any increase in miners' wages, while others with this protection have been made at $1.60. These prices are substantially higher than last year, but no one believes that any considerable tonnage will be placed at any less. The shippers if anything are showing a little more willingness to contract, but even at that are not pressing for tonnage on this basis. Manufacturing interests still continue to stock coal, as the feeling still seems to be general that there are possibilities of trouble Apr. 1. There is very little activity in the export line, although coastwise shipments are going forward in good volume, with freights lower than they have been for some time.

Ruling prices per gross ton at mines are about as follows:

Georges Creek Big Vein	$2.75@3.00	Fairmont gas, ¾	$1.85@2.00
South Fork Miller Vein	2.15@2.35	Fairmont gas, mine-run	1.65@1.75
Clearfield (ordinary)	1.75@1.85	Fairmont gas, slack	1.50@1.60
Somerset (ordinary)	1.70@1.80	Fairmont lump, ordinary	1.60@1.70
West Va. Freeport	1.50@1.60	Fairmont mine-run	1.45@1.55
		Fairmont slack	1.40@1.50

BALTIMORE

The bituminous market, soft due to continued embargoes. Gas coals break more than steam fuels. Exports slightly better.

Influenced adversely by intermittent embargoes against New England and other points north, and a lighter demand in the directions that are open to shipment, the bituminous market eased off again the past week. Better grade steam coals held the firmest, but all grades were spotty and there were occasional sales at below recognized market prices. Gas coals were at times quoted below the dollar mark, for the first time in weeks slack being the only grade to show any particular strength.

The export movement is a little stronger, although confined entirely to Italian shipments. A total of 17,816 tons was loaded here for that country.

At the outset of the present week the quotations to the trade on soft coals were about as follows:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$2.25	$3.43	Ordinary mine run	$0.95@1.10	$2.58
Geo. Crk. Tyson	2.00	3.18	Ordinary ¾	.95@1.10	2.58
Clearfield	1.50	2.68	Ordinary slack	1.10@1.15	
South Fork	1.60	2.78	Low sulphur mine-run	Out of market	
Latrobe	1.30	2.48	Low sulphur ¾	Out of market	
Somerset (best)	1.50	2.68	Low sulphur slack	Out of market	
Somerset (good)	1.40	2.58			
Quemahoning	1.65	2.83			
Freeport	1.25	2.43			
Miller Vein	1.60	2.78			

* F. o. b., outside Capes.

HAMPTON ROADS

Dumpings continue heavy with a good demand and somewhat of a shortage. Circular prices advanced.

The movement from Hampton Roads during the week has shown up well, although there were several days when the coal was badly frozen and dumping was difficult. As usual, the largest part of the coastwise cargoes went to the New England market, practically all of these ports receiving some shipments.

The demand for all grades continues heavy and shippers are having considerable difficulty getting coal forward fast enough to keep vessel tonnage moving quickly. The circular price has been advanced from $2.85 to $3, but so far as can be ascertained, few, if any, sales are being made at this latter figure, even with the demand holding up as it is. The accumulation is being still further reduced and the supply is considerably less than the normal quantity usually on hand.

In addition to the demand for standard Pocahontas and New River there have been a number of inquiries and some sales of both high-volatile and nut and slack. In fact the demand for these grades has been such that there is practically none of these coals on hand at this time except possibly such as is being accumulated to fill contract business.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Jan. 22	Jan. 29	Feb. 5	Feb. 12	Feb. 19
Norfolk & Western	142,335	147,596	128,288	158,265	121,156
Chesapeake & Ohio	98,388	117,715	106,543	106 525	71,513
Virginian	101,237	100,435	75,840	63,056	92,243
Totals	341,960	365,746	310,671	327,846	284,912

Ocean Charters and Freights

OCEAN FREIGHTS

The freight market for export coal continues to advance and conditions are practically the same as a week ago. Shippers are still having great difficulty in securing tonnage, although they are offering higher rates; $16.80 with 500 tons per day discharge is freely offered for any steamers to Lower Plate ports, but tonnage is unobtainable at this rate. Rates to the Windward Islands have made a further advance during the past week, and those to the West Indies are firmer. Shippers of the Mediterranean coal are unwilling to pay rates owners ask; no charters of any importance have been effected in this direction during the past week.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$3.50@4.00	Bermuda	$4.50@5.00
Cardenas or Sagua	4.75	Vera Cruz	6.50@7.00
Cienfuegos	4.50@4.75	Tampico	6.50@7.00
Port au Spain, Trinidad	7.50@8.00	Rio	15.00[4]
St. Lucia	7 50@8.00	Santos*	15.00[4]
St. Thomas	6.50@7.00	Montevideo	18.00[1]
Barbados	7.50@8.00	BuenosAires orLa Plata†	18.00[1]
Kingston	4.50@5.00	Rosario	19.20[2]
Curacao	6.50@7.00p.c[3]	West Coast of Italy	26.40
Santiago	4.50@5.50	Barcelona**	24.00
Guantanamo	4 50@5.50	Valparaiso or Callao	17.00
Demerara	7.00@8.00	Marseilles	25.20

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher. †† For very quick discharge.

[1] 500 tons discharge @ 30c. [2] 500 discharge. [3] And p.c. [4] Net, 1,000 tons discharge.

W. W. Battie & Co.'s Coal Trade Freight Report.

COASTWISE FREIGHTS

While there is no sharp decline in rates from Hampton Roads, the trend is distinctly downward; $1.90@2 is now the quotation on small barges to points like Providence and New Bedford, and 25c. higher to Boston. Large-sized vessels and steamers if offering for single trips continue almost a drug on the market. Freights from New York to Long Island Sound points have receded to 75c., a full 25c. less than a week ago. Still further reductions are looked for.

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Feb. 19:

NORFOLK

Vessel	Destination	Tons
Chas. K. Schull[1]	Para	1,176
River Forth[2]	Valparaiso	1,182
Stephen R. Jones[1]	Rio	5,417
Tricolor[3]	B. Aires	*5,220
Chipana[3]	Bahia Blanca	
Achilles[4]	Canal Zone	12,003
Corozal[5]	San Juan	
Bylayl[6]	B. Aires	4,480
Lysefjord	Manzanillo	1,174
Clara Davis	Santa Cruz	1,113
Eva B. Douglas[6]	St. Georges	1,513

NEWPORT NEWS

Vessel	Destination	Tons
Skogstad[7]	Fort du France	5,500
Lovstaaken[3]		4,000
Kinmount[2]	Valparaiso	2,500

PHILADELPHIA

Grabio D'Ali	Italy	3,403
Sebastino	Italy	5,829
Doonholm	Italy	6,742
Nostra Signora Del Voschett	Italy	1,842

[1] Smokeless Fuel Co. [2] Chesapeake & Ohio Coal & Coke Co. [3] Castner Curran & Bullitt, Inc. [4] W. C. Atwater. [5] B. Whiteley. [6] Barber & Co. [7] Berwind-White.

* And 193 tons of coke.

ATLANTIC SEABOARD

BOSTON

Hampton Roads coals firm at $2.85, but no advance in sight. Dispatch continues excellent; demand is spasmodic. Georges Creek again in short supply and the Pennsylvania grades are once more embargoed against New England all-rail points. Anthracite movement again slow.

Bituminous—The continued cold spell gave a little stimulus to the demand in this territory for Pocahontas and New River but only a few scattering sales were made on the market and there was no pronounced inquiry. Prices were unaffected. While $2.85 f.o.b. Hampton Roads is firmly maintained it is next to impossible to realize any higher figure. Dispatch couldn't be better; apparently all interests have ample supplies standing at the piers, and there is a lack of snap to the trade. Not even the prediction that contract prices will be $3 f.o.b. beginning Apr. 1 will induce any buying for the future. On that date so many consumers will be under contract at the low prices made last fall that meanwhile they will take coal very sparingly. Buyers who have not such contracts will also postpone any franchises on the open market on the ground that prices, as well as marine freights, are almost sure to be lower.

At distributing points a settling tendency has been still further in evidence. Except for small lots on short notice, prices are down to the $2.85 basis plus the current water freight, or about $5.35@5.50 on cars at Boston. No large quantities have been available, and such cargoes as arrive are gradually absorbed. Agencies canvassing for new contracts on a basis higher than last year are meeting with very small response. A good deal depends both on the amount of steamer tonnage available after Apr. 1 and on the prices named by Pennsylvania bituminous interests.

While Georges Creek is short again at tidewater points, the shortage is understood to be only temporary. Meanwhile there are occasional clearances of Georges Creek transportation with Pocahontas and New River at Hampton Roads. There is apparently no news with regard to contract prices for next season, that subject waiting somewhat on the straightening out of present difficulties.

Embargoes are again in force in many of the Pennsylvania districts against most of the New England points all-rail. A little spurt on coal in transit has again developed, but so far prices have not materially advanced. Most operators who have been making exertions to fill contracts are now pruning their lists very carefully, cancelling the quotas due consumers during the period embargoes are effective. Little progress has been made on next season business, shippers and buyers being still far apart in their views of a proper season basis. If the present recurrence of congestion all-rail is only a short one it may be that Mar. 15 will see conditions straightened out sufficiently to warrant some discussion of new prices.

Anthracite—Storms and the cold weather have interfered with barge movement and dealers are again anxious over supplies. Broken is very short at all the piers, and stove is once more in light supply. The steam sizes are none too plentiful. At the same time the few cargoes of independent coal that were sent here on speculation have met hard going. Dealers are not at all inclined to pay even water freights from Philadelphia and New York, so long as there is a chance of getting deliveries on the regular circular.

Bituminous prices, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.90@3.65	$3.20@3.80	.....	$1.75@2.40
Cambrias and Somersets	3.00@3.80	3.35@4.00	.....	1.90@2.65
Georges Creek*	2.92@3.02	3.22@3.32	$2.85@3.00	.....

*Contract

Pocahontas and New River are quoted at $2.85 f.o.b. Norfolk and Newport News, Va. On cars at Boston and Providence, Pocahontas and New River are quoted at $5.25@5.50.

NEW YORK

Anthracite trade active. Quick market for loaded bottoms with good prices. Embargoes continue in force. Bituminous situation slow and prices easy. New contracts closed at advance over last year's prices.

Anthracite—There is considerable activity in the anthracite market. Demand has again braced up and dealers report a heavier call. Shippers had trouble the first of the week in getting boats loaded owing to the frozen condition of the coal as a result of the snow, sleet and rain storms. Loaded boats were in demand and owners found an easy market with prices occasionally above the company circular. Retailers were, however, well supplied and there were but few urgent calls to replenish stocks.

The situation at Tidewater is very easy. Premium coals in the prepared sizes have entirely disappeared; all sizes are plentiful and sales of stove below company circular were reported early in the week. Egg and nut are active and pea coal is now going at regular prices. All buckwheat grades are easy and demand has fallen off. Buckwheat No. 3 is reported short at some of the upper ports.

Current quotations, gross tons, f.o.b., Tidewater follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.30@5.30	5.35	$5.35@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.60@5.60
Pea	3.50	3.50@3.50	3.55	3.55@3.55
Buckwheat	2.75	3.00@3.15	2.80	3.05@3.20
Rice	2.25	2.00@2.30	2.30	2.05@2.35
Barley	1.75	1.50@1.80	1.80	1.55@1.85

Bituminous—Demand for bituminous coal at Tidewater continues slow with prices unchanged. Some strength was shown early in the week due to low temperatures and buying improved slightly; loaded bottoms were snapped up rapidly due to the inability of the docks to handle the frozen coal with dispatch. Shippers are not forcing the market but should demand fall off considerably there promises to be a scramble on the part of some to get rid of their holdings.

Harbor shipments were interfered with early this week by ice in the rivers and nearby Sound points. Most of the embargoes remain in force.

Some new contracts are being closed. Some reports are that no prices are below $1.50 at the mines and as a rule range from 25 to 30c. higher than last year. Another report is that some operators are closing new contracts at last year's prices plus the extra cost of materials, the compensation law, and any advance in wages that may be granted to the mine workers in the new agreement.

Tidewater prices for good grades range from $3.25 to $3.50 f.o.b., while alongside quotations for similar grades are from $4 to $4.25.

Average quotations, gross tons, f.o.b., Tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.25@4.50	$4.25@4.50	$4.25@4.50	$2.75@3.00
Georges Creek Tyson	3.50@3.75	3.50@3.75	3.50@3.75	1.95@2.20
Clearfield:				
Medium	3.25@3.50	3.25@3.50	.....	1.70@1.95
Ordinary	3.25@3.50	3.25@3.50	.....	1.70@1.95
Broad Top Mountain				1.70@1.95
Cambria County:				
South Forks	3.50@3.75	.....	.....	1.95@2.20
Nanty Glo	3.35@3.60	.....	.....	1.80@2.05
Barnesboro	3.25@3.50	.....	.....	1.70@1.95
Somerset County:				
Quemahoning	.....	3.35@3.60	3.35@3.60	1.80@2.05
Medium	3.25@3.50	3.25@3.50	3.25@3.50	1.70@1.95
Latrobe	3.00@3.25	.....	.....	1.45@1.70
Greensburg	3.25@3.40	.....	.....	1.70@1.85
Westmoreland	3.80@4.00	.....	.....	2.25@2.45
West Virginia Fairmont ¾		3.25@3.40	3.25@3.40	1.45@1.60
Fairmont mine-run		3.25@3.40	3.25@3.40	1.45@1.60
Steam		3.00@3.25	3.00@3.25	1.45@1.70
Western Maryland		3.00@3.25	3.00@3.25	1.45@1.70

PHILADELPHIA

Frigid weather gives a snap to the anthracite. Prices steady on all prepared sizes, with stove the strongest. Orders for pea ahead of deliveries. Bituminous experiences a further decline. Some contract prices out.

Anthracite—A few days of frigid weather caused a sharp spurt in the retail trade which benefited the shippers also. However, the big companies are reaping most of the harvest these days, and the individuals are beginning to complain of a poor month's business when they had expected an unusually good one. They are now looking forward to March and hoping the rush will compare with that of March, 1912, when some records were made that have not since been approached.

As Apr. 1 draws near it is generally agreed by all that some radical changes are at hand, and the retailers show a grim determination to place their business on a firmer basis during the reconstruction period. They insist that they cannot continue with the present small margin of profit and their liberal credit system.

The dealers have been much incensed at the recent publication of the operators' statement to the effect that their margin of profit on a ton of stove coal amounts to $2.15 per ton. It has been pointed out to them by the operators that the price was figured on the New York retail price and plainly stated in the advertisement. However, the dealers still insist that it is misleading, claiming that they have had to meet the criticism of customers almost without number since the publication of the advertisement. On the part of the

dealers there is no doubt that the difference between their cost and selling prices in this district, based on all-rail deliveries, which covers about 90% of the yards is as follows: Egg, $1.45, stove, $1.45, chestnut, $1.55 and pea, $1.30.

All sizes are moving steadily this week. Broken coal at $3.35 on contract has long been oversold, and if the spot tonnage available were greater it could be moved at $3.60 without any difficulty. Egg enjoyed another little spurt during the cold days and is still firm at $3.85. Stove is still quite active and no sales have been made below the circular price of $4.10. This size has not been plentiful with any of the shippers of the better grades. Chestnut holds its own but no more than that, and while the price of $4.25 has not been reduced in any case, it is not at all likely now that the immense amount of this size in storage can be moved before Apr. 1. Pea is most active and the demand far exceeds the supply, although no premiums are being obtained and all grades are bringing the circular price of $2.55. If the shippers can secure the cars there is sure to be an enormous stocking of this size before Apr. 1. The steam grades, with the exception of barley, continue to go forward in large volume, with prices practically unchanged for the past six weeks. Coastwise shipments of anthracite continue with a good tonnage moving, and freights somewhat lower, but with vessels still very scarce.

Prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.85	Pea	$2.55	$3.30
Egg	3.85	5.10	Buckwheat	1.55	2.30
Stove	4.10	5.10	Rice	.90	1.80
Chestnut	4.25	5.35	Barley	.55	1.30

Bituminous—Continued railroad congestion with all embargoes still in force has resulted in a further drop in prices on all grades of from 5c. to 20c. a ton. The car supply is so poor that some operations have been reported closed for a day or two at a time. The weather, too, has been anything but favorable to the trade. While very few contracts have been closed, some that have been taken at $1.75 at the mines without protection to cover any increase in miners' wages, while others with this protection have been made at $1.60. These prices are substantially higher than last year, but no one believes that any considerable tonnage will be placed at any less. The shippers if anything are showing a little more willingness to contract, but even at that are not pressing for tonnage on this basis. Manufacturing interests still continue to stock coal, as the feeling still seems to be general that there are possibilities of trouble Apr. 1. There is very little activity in the export line, although coastwise shipments are going forward in good volume, with freights lower than they have been for some time.

Ruling prices per gross ton at mines are about as follows:

Georges Creek Big Vein	$2.75@3.00	Fairmont gas, ¾	$1.85@2.00
South Fork Miller Vein	2.15@2.35	Fairmont gas, mine-run	1.65@1.75
Clearfield (ordinary)	1.75@1.85	Fairmont gas, slack	1.50@1.60
Somerset (ordinary)	1.70@1.80	Fairmont lump, ordinary	1.60@1.70
West Va. Freeport	1.50@1.60	Fairmont mine-run	1.45@1.55
		Fairmont slack	1.40@1.50

BALTIMORE

The bituminous market, soft due to continued embargoes. Gas coals break more than steam fuels. Exports slightly better.

Influenced adversely by intermittent embargoes against New England and other points north, and a lighter demand in the directions that are open to shipment, the bituminous market eased off again the past week. Better grade steam coals held the firmest, but all grades were spotty and there were occasional sales at below recognized market prices. Gas coals were at times quoted below the dollar mark, for the first time in weeks slack being the only grade to show any particular strength.

The export movement is a little stronger, although confined entirely to Italian shipments. A total of 17,816 tons was loaded here for that country.

At the outset of the present week the quotations to the trade on soft coals were about as follows:

	Mines	Balt.*		Mines	Balt.*
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Geo. Crk. Tyson	2.00	3.18	Ordinary ¾	.95@1.10	2.58
Clearfield	1.50	2.68	Ordinary slack	1.10@1.15	
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NEWPORT NEWS

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OHIO VALLEY

PITTSBURGH

Market dull and easier. Car supply poor. Labor not plentiful. Prices slightly easier.

There are very heavy shipments on practically all contracts, particularly on those with the steel trade, which is operating in excess of its nominal capacity. The market for spot coal is extremely quiet as it has been for two or three weeks and while offerings have been relatively limited they have been sufficient to depress prices somewhat, and the market is now on the basis of about $1.25 for mine-run. Slack has softened relative to mine-run and the two descriptions are not as close together as they were. Screened coal has become quotable at its usual spread above mine-run, the low price of ¾-in. having been due to the fact that the slack produced commanded practically as high a price as mine-run.

No definite opinions are expressed as to the outcome of the deliberations on the wage scale. It is uncertain whether any agreement will be reached before Apr. 1 or whether, in the event of a disagreement by that date there will be a suspension of mining.

Car supply was poor all last week, almost as bad as at any time this winter, and averaging about 60% the last two days of the week. Prospects for this week as a whole are not good, for even on Monday there were some slight shortages. There is sufficient labor to mine all the coal for which cars are obtainable, but a full supply of cars would probably disclose a shortage. Most of the embargoes as to shipment East are still in force, while the Eastern markets are reported easier so that a lifting of the embargoes would perhaps not strengthen the local market materially.

There are no regular quotations on contract, and we quote prompt coal as follows: Slack, $1.15@1.20; mine-run, $1.25@1.30; ¾-in., $1.35@1.40; 1¼-in., $1.50@1.60, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous again about normal. Eastern demand not improving. Car shortage offsets general slackness. Anthracite quiet for this period of the year. Big spring demand to the westward expected.

Bituminous—There is but little demand in the Eastern districts that caused the flurry in December. This section has not been short of coal and so has not been obliged to pay excessive prices. Pittsburgh prices have now about settled down to the normal basis, so that it has been thought best to make a Buffalo price, as formerly; this is 15c. over the price made last year, while those prices were not always obtained. There is still quite an amount of No. 8 coal selling here at about 20c. below Pittsburgh, but it is the general idea that it will disappear when the Lakes open, especially as a big demand in that trade is expected.

The Buffalo jobbing trade is badly upset by an order from the Pennsylvania Railroad declining to reconsign cars of coal here, except on the through rate, though the mine owner is pleased over the prospect. The road finds that it has not been able to move freight fast enough to keep junction points clear and this is an effort to facilitate the movement. Jobbers say they cannot route their cars so well from the mines as they could from Buffalo.

Leading Pittsburgh shippers have named a Buffalo price for the various sizes, which they hope to maintain throughout the season; jobbers consider them a trifle low. They are as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.90	$2.75	$2.80
Three-quarter	2.75	2.60	.....
Mine run	2.65	2.50	2.60
Slack	2.25	2.20	2.60

Prices are per net ton, f.o.b., except that east of Rochester and Kingston, Ont.; they are per gross ton.

Anthracite—The weather has been favorable for orders all the month, but the activity is not great. Some of the shippers report surplus coal, which will be loaded into Lake vessels as a spring reserve. There is more stove coal than can be sold readily and chestnut is scarce. Shippers insist on orders that include both, or they would soon be swamped with the larger size.

There is now snow enough in the city to interfere with the coal trucks, but there is no corresponding demand. The consumer is not willing to lay in more than will last till April and he then often forgets to buy till fall. Reports come in that various companies have added to the price on account of the compensation tax, but nothing appears to have been done about it here. Following are regular winter quotations:

	Cars	Vessels	Wagons	Curb
Grate	$5.60	$5.85	$5.40	$6.65
Egg	5.85	6.10	5.65	6.90
Stove	5.85	6.10	5.65	6.90
Chestnut	6.10	6.35	5.90	7.15
Pea	4.30	4.55	4.10	5.35
Buckwheat	3.25	3.50	3.05	4.30

Deliveries are per gross ton on cars and vessels and per net ton on wagons and at curb. An additional charge of about 25c. is made where it cannot be spouted into bin.

DETROIT

More active demand and broader market for steam coal. Retail yards busy. Lake shippers find it difficult to charter vessels.

Bituminous—Orders coming in indicate a more general buying movement in the steam-coal trade, although they are only for a moderate tonnage as a rule. Small sizes are still active but buyers are also taking more interest in other grades; three-quarter lump commands from $1.15 to $1.25 with carrying charge added, while slack ranges around $1.10.

Retail dealers have been busy during the recent cold weather and extra teams have been needed to handle deliveries. With stocks much reduced the retail yards are buying only in small lots in anticipation of a weakening market later. Consignment coal is plentiful but seems to be sold promptly enough to avoid demurrage.

Anthracite—Stove, egg and chestnut in anthracite have sold better recently because of weather conditions. Despite some delays in the movement from the East, the supply is wholly adequate and prices are unchanged.

Lake Trade—Offers of coal cargoes by shippers are evoking little interest among vessel owners. That difficulty will attend the chartering of boats seems certain from the fact that the bulk of Lake traffic will be iron ore and many of the vessels will go up light. The C. Reiss Coal Co. has acquired four steel freighters from the Peavey Steamship Co. at a valuation reported as $1,000,000.

TOLEDO

Supplies at upper Lake docks light. Shortage threatened. Over supply of coal results in weaker market, locally.

Weather conditions have been responsible for a weakness in the local domestic trade the past week. The steam trade has also slumped some, owing to the cessation in Eastern shipments, which has thrown a lot of coal back onto this market. The steam market as well as domestic is a trifle off in price and quotations are difficult to make. Slack, which has been exceptionally strong, is also showing a tendency toward weakness being quoted at from 75c. to $1. The Pocahontas spring prices will soon be on and dealers are inclined to wait for the change rather than to place orders now. Railroads are heavily stocked here, but industrial plants are carrying only normal supplies.

It is generally believed that the Lake trade will be exceptionally strong and some in a position to know declare that the supplies at the head of the Lakes are badly depleted and a shortage is imminent.

COLUMBUS

Some weakness in domestic sizes and steam business is less active. The tone of the market is good and the outlook fair.

The trade has been a little slow during the past week, due to unfavorable weather conditions and the fact that all of the stocking to guard against a suspension after Apr. 1, has been done. The retailers are not inclined to buy in large quantities. The tone of the market, however, is good and future prospects are not considered adverse.

Retailers are not doing their usual business for the time of the year because of the mild temperatures. The winter has been unusually open and the coal consumption small. Orders are generally small as householders do not want to stock up at this time. Rural dealers are not buying much as the bad roads have made it almost impossible for farmers to haul fuel. There is a weakness in Pocahontas which is unusual for this time of the year.

Anthracite trade is active and the consumption of hard coal is increasing in this territory. Coke trade is also rather good.

Steam business is holding up fairly well as manufacturing continues to expand. There is a good demand from the iron and steel concerns and other lines are also in the market for a good tonnage. Most of the stocking on the part of railroads and factories is now over.

Car shortage is becoming more apparent on the Ohio roads. For a time the shortage of equipment was confined to the West Virginia lines but recently roads in eastern Ohio have been suffering. It is believed that the car shortage will increase from this time on.

Prices in Ohio fields, f.o.b. mines, per short ton, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.40	$1.50
Three-quarter-inch	1.40	1.40	.....	1.40
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.15
Nut, pea and slack	.95	1.00	.90	.90
Coarse slack	.85	.90	.80	.80

CINCINNATI

Demand limited, but continued car shortage maintains the market. Moderating weather a depressing factor.

With the end of the winter season practically at hand, the demand in all quarters is naturally at a low ebb, except insofar as it is stimulated, to a certain extent, by limited supplies. Increasing inability of mines along the C. & O. to get cars for more than a two- or three-day run has stiffened prices for some grades in this market, although the better situation with reference to cars on other lines serving West Virginia mines has prevented anything like an advance. Continued disinclination of retailers to buy domestic sizes in any quantity keeps nut and slack at a premium, more than the actual demand for screenings in point of volume. The trade as a whole is inclined to pessimism.

BIRMINGHAM

Trade quiet but an improvement in sight. Government to try out Alabama coals.

Business on both steam and lump coal is rather quiet, although the operators are looking forward to better conditions within the next 30 days, when the brick and ice plants begin taking their requirements of steam coal, and spring prices on lump coal go into effect. The bunker business at the various Gulf ports is quiet; river coal is holding its own, or increasing, while all-rail coal seems to be slightly off. An encouraging development is the fact that the Government has decided to give the Alabama coals a thorough test on vessels at various Gulf ports, and it is expected that this will result in a large increase in the bunker business. Blacksmith coal is satisfactory, as to price, though the tonnage is slightly off. While the car supply has inconvenienced some of the larger interests, especially the furnace companies consuming their own coal and coke, the situation is not serious.

COKE

CONNELLSVILLE

Coke market dull despite iron and steel activity. Prices unchanged. Future to be affected by new byproduct capacity coming in.

The coke market is very uneventful, considering the high pressure at which the steel industry is operating and the frequent interruptions to coke shipments on account of car shortages. The furnaces could doubtless use more coke, in many instances, than they are receiving, but they are averse to buying much in the open market for fear coke would be diverted from contracts. A few purchases of prompt lots have been quietly made in the past week.

No general advance in coke prices is now to be expected as the blast-furnace industry is operating practically at capacity already and is being supplied with coke. Car shortages may occasion sharp temporary advances in the spot market, but the general trend of prices this year promises to be downward, with new byproduct capacity coming in from month to month. The large extension at South Bethlehem should be completed shortly, and it is expected not only to take the Bethlehem Steel Co. entirely out of the market as a buyer, but to make it a seller of perhaps as much as 50,000 tons a month. About Apr. 1 new byproduct ovens at Youngstown and Toledo are expected, releasing Connellsville coke that is now going to the furnace interests that are completing byproduct ovens. We quote: Prompt furnace, $3.25@3.50; contract, first half, $2.35@2.50; year, $2.25@2.35; prompt foundry, $3.75@4.25; contract, $3.25@3.75, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Feb. 12 at 441,309 tons, an increase of 8,127 tons, and shipments at 432,456 tons, an increase of 1,770 tons.

Buffalo—The car shortage is as bad as ever and some very high prices are now and then paid by consumers who allow themselves to run out of stock. The market is still practically bare of stock coke, off-grade furnace taking its place as far as possible. With the present slow rail movement it is not likely that the supply will increase much very soon and the consumption is as large as ever. Quotations are: $6@6.10 for best 72-hr. Connellsville foundry and $5.10@5.25 for 48-hr. furnace.

Chicago—The coke market has assumed more normal proportions, Connellsville being easier, but byproduct sizes, both foundry and domestic, are still strong at last week's figures. Prices per net ton, f.o.b. cars, Chicago, are as follows: Connellsville, $6.25@6.50; Wise County, $6.50; byproduct foundry, $6.00@6.25; byproduct domestic, $5@5.25; gas house, $4.50@4.75.

St. Louis—The movement of coke, for all purposes, has toned down considerably, owing to mild weather and a cessation of storage. Domestic demand is light and industrial not active. Prices are holding firm at the following figures, per net ton, f.o.b. cars, St. Louis: Byproduct (all sizes), $5.25; gashouse (lump and egg), $4.50; petroleum (lump), $6.75.

Birmingham—The tonnage of foundry coke moving is still off and no immediate improvement is looked for in this line. Furnace coke is booming with the ovens working at full capacity and there is no trouble in disposing of the product at prices, ranging from $2.75@3 per ton, f.o.b. ovens.

MIDDLE WESTERN

GENERAL REVIEW

Demand maintained although weather is warmer. Steam coals still very strong. Prices vary over a narrow range. Smokeless shows gain.

A consistent and well maintained demand for domestic coal throughout the week has been noticeable. The strength of the market continues to center in steam sizes, which are generally in active demand at maximum figures. Prices for spot screenings are fully 35c. per ton higher than at this period last year. Storage is proceeding along moderate lines and some of the transportation interests are again taking heavy shipments. Some buyers, however, have an accumulation of coal on tracks which prevents them from absorbing additional tonnage even though so inclined.

Although car supply is less stringent, shortages occur here and there and movement of commercial coal is slow. Eastern grades are moving to this territory more briskly. Smokeless coals are stronger owing to shortage of tonnage allotted to Western territory. Anthracite continues active and dealers evidently believe a shutdown is likely in the anthracite field. An increasing amount of splint coal is being sold in the Western States for steam use and this is bringing maximum prices. Smithing grades are also moving freely and the supply is not equal to the demand. Milder weather in the Northwest has checked the demand for Illinois coals from that section, although supplies at a majority of Western points are known to be insufficient to cover even a short cessation in the mining regions.

Most operators hesitate to venture an opinion as to the outcome of the labor conferences but reports showing lack of progress has caused a number of shippers and retailers to believe that a settlement is impossible, and there has been renewed buying of storage coal.

CHICAGO

Prices well maintained. Storage demand strong. Demand from retail yards brisk.

The Franklin and Williamson County situation is strong in every respect, an increase having developed in storage buying. Domestic demand has eased off somewhat, but prices are no lower. Fine coal is selling at around $1. Shipments of Williamson County grades to southern points have been lessened because of high water, but Northern markets have readily absorbed this surplus tonnage. Franklin County operators are about ten days behind their orders.

Movement of steam coals has been the prominent feature of the Springfield district this week, absorption being unusually heavy. Prices of screenings are averaging around 95c.

Satisfactory conditions are reported at Indiana mines. Domestic movement has been very strong from the retail trade. Screenings are active and none too plentiful, averaging $1 for Clinton and Knox County production. Slightly higher prices are being received for No. 4 fine coal. Mine-run is in strong demand for storage business from all districts.

While smokeless prepared sizes are only being supplied in moderate volume for domestic purposes, mine-run is in much better shape. The price situation is improved by reason of the short car supply. Splint coals seem to be increasing in favor, and a heavier tonnage has been moving to Western points at high prices. The only Pennsylvania smokeless coals reaching this market are contract shipments, which only cover minimum requirements, whereas the trade could readily take maximum tonnage if they could get it.

Kentucky grades are not so strong, off qualities of domestic lump having declined in some cases 20c. per ton; but high grade Miller's Creek is still readily sold at $2.40. Hocking

transactions have been of small volume, and the few sales made of 1¼-in. lump were little under last week's figures.

Quotations in the Chicago market, per net ton f.o.b. cars mines, are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.50@1.75	$1.60@1.75	$1.60@1.75	$1.50@1.60
Steam lump	....	1.25@1.35	1.25@1.35	1.30@1.35	1.30@1.35
2½ and 3-in. lump	1.50@1.65	....	1.35@1.45	1.30@1.40	1.25@1.35
1¼-in. lump	1.40@1.50		1.30@1.35	....	1.35@1.40
Egg	1.60@1.75	1.60@1.75	1.25@1.30	1.50	1.40@1.50
Nut	1.60@1.75	1.50@1.65	1.15@1.25	1.25@1.35	1.10@1.25
No. 1 washed	1.60@1.75	....	1.50	....	....
No. 2 washed	1.50@1.60	....	1.40	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.10@1.15	1.05@1.10	1.05@1.15	1.05@1.10	1.10@1.20
Screenings	.95@1.10	.85@ .95	.85@ .95	95@1.00	.95@1.00

	Harriaburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.65@2.40	$1.80@2.00	$1.85@2.00	$1.75@1.90
1¼-in. lump	1.40@1.50				1.50@1.60
Egg	1.60@1.75	1.45@2.00	1.85@2.00	1.90@2.00	1.60@1.75
Nut	1.50@1.60	1.30@1.70	1.50@1.75	1.60@1.75	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.50@1.60	....	....	....	....
Mine-run	1.10@1.15	1.10@1.25	1.25@1.40	1.25@1.40	1.15@1.25
Screenings	1.00@1.10	.90@ .95	....	....	.90@1.15

Kanawha Splint Lump $1.60@1.90.

ST. LOUIS

Mild weather restricts demand for all sizes. Screenings slow and somewhat weaker. Surplus accumulating at mines. Car supply short.

Suspense on the part of the buyer, who is awaiting a definite outcome of the labor conference, in conjunction with the warm weather of the past week have brought about a condition unlooked for in the local market. The recession is not limited to any particular size.

Williamson and Franklin County shippers through an accumulation of orders booked during the recent cold spell are able to keep up a steady operation of the mines but unless something new develops shortly, they will be forced to curtail operations. Screenings from this section, while plentiful, are not in such active demand as heretofore and sales are being made at the low rather than at the high prices. Lump, egg and nut prices show a tendency to weaken somewhat.

Staunton and Mt. Olive coals are moving in good volume principally for steam and storage use. Domestic demand has moderated. Montgomery County is concentrating its energies on enlarging storage piles.

Following are the prices, per net ton, f.o.b. cars at the mines:

	Williamson and Franklin	Staunton and Mt. Olive	Montgomery Co.	Intermediate	Standard
8-in. lump	.....	.....	.....	$1.25@1.50	$1.10@1.25
6-in. lump	$1.60@1.75	$1.35@1.50	$1.35@1.50	1.25@1.50	1.10@1.25
3-in. lump	1.50@1.65	1.25@1.35	.....	1.25@1.50	.....
2-in. lump	1.40@1.50	1.25@1.35	.....	1.15@1.30	.95@1.10
1¼-in. lump	1.40@1.50	.....	1.20@1.35	1.10@1.25	.90@1.10
6x3-in. egg	1.60@1.65	.....	1.35@1.50	1.25@1.50	1.10@1.25
6x2-in. egg	.....	.....	1.20@1.35	1.15@1.30	.90@1.10
6x1¼-in. egg	1.40@1.50	.....	1.20@1.35	1.10@1.25	.90@1.10
No. 1 nut	1.35@1.50	.....	1.25@1.40	1.10@1.25	.95@1.10
No. 2 nut	1.25@1.40	1.00@1.15	.....	.90@1.10	.90@1.05
Mine run	1.10@1.20	1.10@1.15	1.10@1.15	1.05@1.15	.90@1.00
Screenings	.90@1.00	.75@ .90	.75@ .90	.70@ .85	.70@ .85
Washed					
No. 1 nut	1.60@1.75	1.50@1.60	.....	1.50@1.60	1.50@1.60
No. 2 nut	1.50@1.60	1.25@1.40	.....	1.25@1.40	1.25@1.40
No. 3 nut	1.50@1.60	1.20@1.30	.....	1.20@1.30	1.20@1.30
No. 4 pea	1.50@1.60	1.15@1.25	.....	1.15@1.25	1.15@1.25
No. 5 slack	.90@1.00	.75@ .85	.....	.75@ .85	.70@ .85

DULUTH

Weather conditions show some improvement. Bituminous prices strong and market active. Car supply is becoming slightly better.

Milder weather for the past week has caused a big slump in the orders and has given the overworked dock operator a chance to clean up much of the business that has accumulated for the past month. A slight improvement in the car situation is noted but shipments are still greatly delayed. Prices are firm, the domestic sizes of smokeless and nearly all the various kinds of screenings commanding a premium. Quotations per short ton f.o.b. cars Duluth docks are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$5.00	$3.75
Dock run	3.10	3.10	3.05	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	5.00	3.65
Screenings	2.50	2.50	2.25	2.75	2.55

The demand for anthracite continues brisk and shipments are quite heavy. With the exception of a shortage in buckwheat, which does not affect the trade to any great extent, the supply is apparently ample. Quotations per short ton f.o.b. docks are as follows: Nut, $7.10; egg and stove, $6.85; pea, $5.55; and buckwheat, $4.

PRODUCTION AND TRANSPORTATION STATISTICS

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for November 1914-15, and for the eleven months ending November, 1913-14-15, in long tons:

	November		Eleven Months		
Imports:	1914	1915	1913	1914	1915
Anthracite, total	40	22	913	19,335	2,825
Bituminous, total	118,673	135,319	1,248,796	1,207,281	1,346,214
United Kingdom	7,757	600	5,329	16,429	17,187
Canada	97,386	126,929	979,980	937,833	1,086,698
Japan	5,840	3,300	99,437	55,939	81,519
Australia	7,490	4,490	160,754	194,827	158,023
Other countries	200	.....	3,296	2,253	2,787
Coke	20,926	2,428	78,913	114,862	43,473
Exports					
Anthracite total	239,286	290,699	3,927,995	3,645,777	3,247,277
Canada	233,856	279,092	3,863,911	3,585,425	3,157,615
Argentina	.....	.....	.....	.....	2,469
Brazil	.....	.....	.....	6	2,415
Uruguay	.....	.....	.....	.....	605
Other countries	5,430	11,607	64,084	60,346	84,173
Bituminous total	850,547	1,396,337	16,856,781	13,105,304	15,600,347
Italy	.....	116,244	.....	.....	2,747,181
Canada	520,657	948,978	12,749,300	8,742,124	7,725,086
Panama	11,961	42,549	452,551	251,798	481,004
Mexico	35,277	11,258	439,427	324,536	262,090
Cuba	103,768	87,446	1,200,958	1,012,092	1,034,423
West Indies	13,809	58,216	548,454	524,004	467,259
Argentina	24,039	27,500	70,048	231,943	759,321
Brazil	25,483	25,159	250,663	260,936	578,473
Uruguay	4,269	.....	5,163	76,088	152,094
Other countries	111,284	78,987	1,140,217	1,681,783	1,393,416
Total coal	1,089,833	1,687,036	20,784,776	16,751,081	18,847,624
Coke	32,891	67,468	805,320	544,098	726,408
Bunker coal	489,301	588,291	7,093,271	6,775,071	6,900,278

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for December and the six months of the fiscal years 1914 and 1915, in short tons:

	December				Six Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater	356,483	17	187,931	13	2,521,513	20	1,797,457	16
East	285,478	14	227,978	15	1,312,001	10	1,282,750	12
West	1,264,723	60	1,040,097	69	7,936,525	62	7,322,837	67
Total	1,906,684		1,456,006		11,770,039		10,403,044	
From Connections								
Bituminous	183,968	9	45,080	3	1,091,351	8	588,433	5
Anthra. (local)	42		....		1,151		35	
Anthracite	1,447		1,082		8,274		8,835	
Total	2,092,141	100	1,502,168	100	12,870,815	100	11,000,347	100
Coke	44,130		11,207		193,940		90,877	

FOREIGN MARKETS

GREAT BRITAIN

Feb. 4—There is no relaxation in the exceedingly strong tendency lately shown for all classes of coal. Supplies are very short. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$8.16@8.40
Best seconds	Nominal	Seconds	7.92
Seconds	$8.16@8.40	Best Cardiff smalls	4.08@4.32
Best dry coals	8.16@8.40	Cargo smalls	3.12@3.60

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Owing to the difficulty of arranging loading turns chartering is restricted. Mediterranean rates are easier. Rates are approximately as follows:

Gibraltar	$10.56	Naples	$14.40	St. Vincent	$11.52
Marseilles	15.44	Alexandria	21.12	River Plate	10.80
Algiers	13.51	Port Said	21.12		
Genoa	14.40	Las Palmas	10.32		

SOUTH AFRICA

The gross coal production of the Union of South Africa for November of last year amounted to 880,197 short tons, of which 731,799 tons were sold for commercial purposes. Sales for October amounted to 664,838 tons. The gross production for the year 1914 amounted to 8,447,923 tons, as compared with 8,801,216 tons for 1913.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

New Business

Volume and page number in parenthesis at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

2234—Hannibal, Miss.—The Atlas Portland Cement Co. is receiving bids for its annual fuel requirements, involving approximately 125,000 tons of Franklin County ½- or ⅝-in. screenings. Address Pur. Agt. F. Bassinger, 30 Broadway, New York, N. Y.

2235—Chicago, Ill.—The Chicago Gravel Co. will contract for its annual fuel requirements, involving about four cars of coal per week, on Apr. 1. Wilmington coal is used mostly, though some Indiana grades are required also. Address Pur. Agt. James A. Hart, Chicago Gravel Co., 343 South Dearborn St., Chicago, Ill.

2236—Cleveland, Ohio—The National Malleable Casting Co. will contract for its annual fuel requirements, involving approximately 25,000 tons of Youghiogheny ¾-in. coal, some time in April. Deliveries are to be made in hopper bottom cars and must be by Pennsylvania R.R. Address Pur. Agt. T. W. Cornell, the National Malleable Casting Co., 7706 Platt Ave., S. E., Cleveland, Ohio.

2237—Janesville, Wis.—The Janesville Machine Co. will contract for its annual fuel requirements, involving about 2,500 tons of nut coal, on Apr. 1. Deliveries are made by Chicago & Northwestern R.R. Address Pur. Agt. C. O. Eddy, Janesville Machine Co., Janesville, Wis. (No. 354, Vol. 7, pp. 566, 750.)

2238—Chicago, Ill.—The Alston Lucas Paint Co. will contract for its annual fuel requirements, involving about one car of Illinois egg coal per week, on Apr. 1. Address Pur. Agt. Thomas E. Clark, the Alston Lucas Paint Co., 1029 Currier St., Chicago, Ill.

2239—New Philadelphia, Ohio—The American Sheet and Tin Plate Co. usually contracts for its annual fuel requirements, involving approximately 60,000 tons of Cambridge or Goshen mine-run coal, some time in March. Deliveries are to be made in hopper bottom cars, and must be by Baltimore & Ohio R.R. Address Pur. Agt. M. S. Dennis, the American Sheet and Tin Plate Co., Frick Building, Pittsburgh, Penn.

2240—Cleveland, Ohio—The Grasselli Chemical Co. will receive quotations during March for its annual fuel requirements, as follows: 35,000 tons of Youghiogheny slack; 7,000 tons of Youghiogheny ¾-in.; 1,000 tons Youghiogheny nut; 9,000 tons of Pittsburgh No. 8 ¾-in. lump; 2,000 tons of Pittsburgh No. 8 mine-run. Deliveries are made by Baltimore & Ohio R.R. Address Pur. Agt. A. C. Bailey, Grasselli Chemical Co., the Arcade, Cleveland, Ohio.

2241—Chicago, Ill.—The Hately Cold Storage Co. will consider a proposition covering its annual fuel requirements, involving about 5,000 tons of Illinois or Indiana mine-run, on Apr. 1. The company is buying in the open market at the present time. Address Pur. Agt. Miller, the Hately Cold Storage Co., 1341 West 37th St., Chicago, Ill.

2242—Canal Dover, Ohio—The American Sheet and Tin Plate Co. usually contracts for the requirements of this plant, involving about 67,500 tons of Cambridge or Goshen mine-run, some time in March. Deliveries are to be in hopper bottom cars and may be either by the Baltimore & Ohio or Pennsylvania R.R. Address Pur. Agt. M. S. Dennis, the American Sheet and Tin Plate Co., Frick Building, Pittsburgh, Penn.

2243—Pittsfield, Mass.—The Post Office Department at this place will receive bids until Apr. 21 for furnishing between 90 and 100 tons of coal for use in the Post Office Building during the ensuing year. Address Postmaster John G. Orr, Pittsfield, Mass.

2244—Chicago, Ill.—The Railway Terminal Warehouse Co. is receiving bids for its annual fuel requirements, involving approximately 500 tons of Pocahontas mine-run coal. Address Pur. Agt. McDonnell, Railway Terminal Warehouse Co., 444 West Grand Ave., Chicago, Ill.

2245—Coatesville, Penn.—The Chester Valley Electric Co. contracts for its annual fuel supply on Apr. 1. Deliveries are made by Pennsylvania R.R. Address Purchasing Agent, The Chester Valley Electric Co., Coatesville, Penn.

2246—Columbia, Penn.—The Columbia Wagon Works contracts for its annual supply on Apr. 1. Address Purchasing Agent, Columbia Wagon Works, Columbia, Penn.

2247—Columbia, Penn.—The Columbia Lace Mill contracts for its annual fuel supply on Apr. 1. Address Purchasing Agent, Columbia Lace Mills, Columbia, Penn.

2248—Clifton Heights, Penn.—Nelson Kershaw contracts for his annual fuel requirements on Apr. 1. Address Nelson Kershaw, Clifton Heights, Penn.

2249—Camden, N. J.—The Peerless Kid Co. contracts for its annual fuel requirements, involving about 1,500 tons, on Apr. 1. Deliveries are made by Pennsylvania R.R. and Philadelphia & Reading R.R. Address Purchasing Agent, Peerless Kid Co., Camden, N. J.

2250—Camden, N. J.—F. A. Path & Sons contract for their annual fuel supply, involving about 3,500 tons of coal on Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address F. A. Path & Sons, Camden, N. J.

2251—Camden, N. J.—The Camden Pottery Co. contracts for its annual fuel supply on Apr. 1. Address Pur. Agt. Wright, Camden Pottery Co., Camden, N. J.

2252—Cape May Court House, N. J.—The Thompson Hotel contracts for its annual fuel supply, involving about 150 tons of anthracite stove coal, on Apr. 1. Address Purchasing Agent, Thompson Hotel, Cape May Court House, N. J.

2253—Cape May Court House, N. J.—The Elmers Bakery at this place usually contracts for its annual fuel requirements some time in April. Address Proprietor R. M. Elmer, The Elmers Bakery, Cape May Court House, N. J.

2254—Cape May Court House, N. J.—William J. Tyler contracts for his annual fuel supply on Apr. 1. Address William J. Tyler, Cape May Court House, N. J.

2255—Highbridge, N. J.—The Taylor Iron and Steel Co. contracts for its annual fuel supply on Apr. 1. Address Purchasing Agent, Taylor Iron and Steel Co., Highbridge, N. J.

2256—Lancaster, Penn.—The Lancaster Mfg. Co. contracts for its annual fuel supply, involving about 40,000 tons of coal, on Apr. 1. Address Sec. R. A. Barton, Lancaster Mfg. Co., Lancaster, Penn.

2258—Chicago, Ill.—The Spiegel-May-Stern Co. contracts for its annual fuel requirements, involving approximately 2,000 tons of Carterville washed coal on or before Apr. 1. Address Purchasing Agent, Spiegel-May-Stern Co., 1055 West 35th St., Chicago, Ill.

2259—Lancaster, Penn.—The Southern Pipe Line Co. will contract for its annual fuel requirements, involving 22,500 tons of coal, on Apr. 1. The company has plants at Knepper, Millway, State Line and Watson. Deliveries are made by Pennsylvania R.R. Address J. W. Vandergrift, Southern Pipe Line Co., Lancaster, Penn.

2260—Lambertville, N. J.—The Lambertville Pottery Works will contract for its annual fuel requirements, involving approximately 2,100 tons, on Apr. 1. Address Purchasing Agent, The Lambertville Pottery Works, Lambertville, N. J.

2261—Lyndhurst, N. J.—The United Cork Companies contract for their annual supply on April 1. Deliveries are made by D. L. & W. R.R. Address Pur. Agt. Boyz, United Cork Companies, Lyndhurst, N. J.

2262—Frankfort, Ind.—The Frankfort Heating Co. usually contracts for its annual fuel requirements, involving about 100 tons of screenings per day, on or after Apr. 1. Address Pur. Agt. A. C. Alexander, Frankfort Heating Co., Logansport, Ind.

2263—Columbus, Ohio—Bids were received by the Department of Public Safety until Feb. 21, for furnishing 6,000 tons of coal for the municipal light plant, and 1,000 tons for the garbage reduction plant. Alternate bids are requested as follows: 3,000 tons of mine-run for the light plant and 3,000 tons of nut, pea and slack for the same department; 6,000 tons mine-run or nut, pea and slack for the light plant, and 1,000 tons of nut, pea and slack and mine-run for the garbage reduction plant. Address Director of Public Safety, Columbus, Ohio. (Vol. 7, pp. 231, 358.)

2264—Mays Landing, N. J.—The Mays Landing Water and Power Co. contracts for its annual fuel supply, involving about 2,000 tons, on Apr. 1. Address Geo. Wood, Mays Landing Water and Power Co., 626 Chestnut St., Philadelphia, Penn.

2265—Matawan, N. J.—The New Jersey Brick and Tile Co. contracts for its annual fuel supply on Apr. 1. Address Purchasing Agent, The New Jersey Brick and Tile Co., Matawan, N. J.

2266—Chicago, Ill.—The Bowman Dairy Co. will contract for its annual fuel requirements, involving 14 to 15 cars of Illinois screenings per month, about Apr. 1. Address Pur. Agt. B. B. Peck, Bowman Dairy Co., 158 West Ontario St., Chicago, Ill. (No. 518, Vol. 7, pp. 666, 748.)

2267—Detroit, Mich.—Sealed bids were received by the Department of Public Works until 10 a.m., Feb. 21, for furnishing and delivering coal as may be required to the various city departments. All bids must be accompanied by a certified check for not less than $800. Address Comr. Geo. H. Feukell, Dept. of Pub. Wks., Detroit, Mich. (No. 1714, Vol. 8, p. 998, Vol. 9, p. 278.)

2268—Gary, Ind.—The Gary Ice and Coal Co. will contract for its annual requirements of steam and domestic coal about Mar. 15. Address Pur. Agt., Gerkovitch, The Gary Ice and Coal Co., Gary, Ind.

2269—St. Louis, Mo.—The Mississippi River Commission will contract for its annual fuel requirements, involving approximately 20,800 tons of coal, to be loaded on barges on Mar. 17, bids being received until 11 a.m. Address Secretary, Mississippi River Commission, 1311 International Life Bldg., St. Louis, Mo.

2270—New York, N. Y.—American Can Co. contracts for its annual fuel requirements on Apr. 1. Address Purchasing Agent, American Can Co., 14th St. and 10th Ave., New York.

2271—New York, N. Y.—The International Paper Co. contracts for its annual fuel requirements, involving about 200,000 tons, on Apr. 1. Deliveries are made by both water and rail to various points in Massachusetts, Vermont, Maine and New Hampshire. Address Pur. Agt. E. C. Smith, International Paper Co., 30 Broad St., New York City. (No. 236, Vol. 7, pp. 447, 1083.)

2272—Ocean City, N. J.—The Ocean City Electric Light Co. contracts for its annual fuel supply, involving about 3,000 tons of coal, on Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address Pur. Agt. W. H. Moore, Ocean City Electric Light Co., Ocean City, N. J.

2273—Kankakee, Ill.—The Illinois Fuel and Phosphate Co. will contract for its annual fuel requirements, involving approximately 5,000 tons of Central Illinois coal, and a similar tonnage of Franklin County domestic coal at any time now. Address Pur. Agt. C. H. Rumley, The Illinois Fuel and Phosphate Co., Kankakee, Ill.

2274—Norristown, Penn.—R. S. Newbold & Sons Co. contracts for its annual fuel supply about Apr. 1, deliveries being made by Pennsylvania R.R. and Philadelphia & Reading R.R. Address Pur. Agt. Newbold, R. F. Newbold & Sons Co., Norristown, Penn.

2275—Norristown, Penn.—The Norristown M. & A. Co. contracts for its annual fuel supply about Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address Supt. A. K. Burgstresser, Norristown M. & A. Co., Norristown, Penn.

2276—Norristown, Penn.—The Wildman Manufacturing Co. contracts for its annual fuel requirements about Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address Pur. Agt. Banord, Wildman Manufacturing Co., Norristown, Penn.

2277—Norristown, Penn.—The Merchants' Ice Co. contracts for its annual fuel requirements about Apr. 1, deliveries being made by Philadelphia & Reading R.R. Address Pur. Agt. Smith, Merchants' Ice Co., Norristown, Penn.

2278—Norristown, Penn.—The Norristown Water-Works contracts for its annual fuel requirements about Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address Pur. Agt. Jackson, Norristown Water-Works, Norristown, Penn.

2279—Norristown, Penn.—The Globe Knitting Mills contracts for its annual fuel supply, involving about 2,000 tons, on Apr. 1. The company uses "Vinton" coal. Deliveries are made by Pennsylvania R.R. Address Pur. Agt. Taylor, The Globe Knitting Mills, Norristown, Penn.

2280—Norristown, Penn.—The Quaker City Shirt Manufacturing Co. contracts for its annual fuel requirements, involving about 1,200 tons, on Apr. 1. Address Pur. Agt. Tyson, The Quaker City Shirt Manufacturing Co., Norristown, Penn.

2281—Buffington, Ind.—The Universal Portland Cement Co. will soon contract for its annual fuel requirements, involving approximately 300,000 tons of Franklin County ½-in. screenings. The current contract expires Apr. 1. Address Pur. Agt. C. F. Collins, 72 W. Adams St., Chicago, Ill.

2282—Norristown, Penn.—Rambo & Regan contract for their annual fuel requirements, involving about 5,000 tons, on Apr. 1. Address Pur. Agt. Regan, Rambo & Regan, Norristown, Penn.

2283—Norristown, Penn.—The Norristown Woolen Co. contracts for its annual fuel supply, involving about 1,500 tons of coal, on Apr. 1. Deliveries are made by Pennsylvania R.R. Address Purchasing Agent, The Norristown Woolen Co., Norristown, Penn.

2284—Norristown, Penn.—Lukens & Yerkes Quarry contracts for its annual fuel supply, involving about 2,000 tons, on Apr. 1. Address Purchasing Agent, Lukens & Yerkes Quarry, Norristown, Penn.

2285—Grand Rapids, Mich.—The American Cement Plaster Co. will soon contract for its annual fuel requirements, involving approximately 10,000 tons of Kanawha mine-run coal. Address Purchasing Agent, American Cement Plaster Co., Grand Rapids, Mich.

2286—New Hope, Penn.—The Union Mills Paper Manufacturing Co. contracts for its annual fuel requirements on Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address Purchasing Agent, Union Mills Paper Manufacturing Co., New Hope, Penn.

2287—Pittston, Penn.—The Citizens' Electric and Illuminating Co. usually contracts for its annual fuel requirements about Apr. 1. Address Purchasing Agent, Citizens' Electric and Illuminating Co., Pittston, Penn.

2288—Pottstown, Penn.—The Glasgow Iron Works usually contracts for its annual fuel requirements about Apr. 1. Grades of coal suitable for both puddling and steam making is required, and deliveries are made by Philadelphia & Reading and Pennsylvania railroads. Address Pur. Agt. C. B. Shoemaker, The Glasgow Iron Works, Pittstown, Penn.

2289—Pottstown, Penn.—Geo. B. Lessig Co. contracts for its annual fuel supply about Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address L. C. Lessig, Geo. B. Lessig Co., Pottstown, Penn.

2290—Newark, N. J.—Bids will be received at the local Post Office until 2 p.m., Apr. 10, for furnishing and delivering approximately 510 tons of anthracite coal. Address Custodian Frank J. Bock, United States Post Office, Newark, N. J.

2291—Indiana Harbor, Ind.—The American Steel Foundries Co. will soon contract for its annual fuel requirements, involving approximately 2,000 tons of Franklin County or Carterville 1½-in. screenings. Address Pur. Agt. T. E. Moritz, American Steel Foundries Co., Indiana Harbor, Ind.

2292—Pleasant Mills, N. J.—The Pleasant Mills Paper Co. usually contracts for its annual fuel requirements, involving approximately 3,000 tons, on Apr. 1. Address Mgr. Kahr, The Pleasant Mills Paper Co., Pleasant Mills, N. J.

2293—Quinton, N. J.—Samuel L. Kelty contracts for his annual fuel requirements, involving about 300 tons of Georges Creek coal, on Apr. 1. Address Samuel L. Kelty, Quinton, N. J.

2294—Reading, Penn.—The Reading Standard Co. contracts for its annual fuel supply, involving about 800 tons, on Apr. 1. Address Pur. Agt. V. C. Vogel, Reading Standard Co., Reading, Penn.

2295—Royersford, Penn.—Floyd Wells & Co. contracts for its annual fuel supply about Apr. 1. Deliveries are made by Philadelphia & Reading R.R. Address Pur. Agt. Brooks, Floyd Wells & Co., Royersford, Penn.

2296—Royersford, Penn.—Thomas & Buckwalter contract for their annual fuel requirements on Apr. 1, deliveries being made by Philadelphia & Reading R.R. Address Pur. Agt. Thomas, Thomas & Buckwalter, Royersford, Penn.

2297—Royersford, Penn.—The Diamond Glass Co. usually contracts for its annual fuel requirements, involving approximately 4,000 tons of gas coal, on Apr. 1. It is understood that the Berwind-White Coal Mining Co. has the present contract. Deliveries are made by Philadelphia & Reading R.R. Address Pur. Agt. Murray, The Diamond Glass Co., Royersford, Penn.

2298—Swarthmore, Penn.—The Franklin Paper Mills Co. at this place usually contracts for its annual fuel requirements, involving about 56,000 tons of coal, on Apr. 1. Address Purchasing Agent, Franklin Paper Mills Co., 160 Cornelison Ave., Swarthmore, Penn.

2299—Rock Island, Ill.—The Standard Oil Cloth Co. will contract for its annual fuel requirements, involving two cars of screenings per week, on Apr. 1. The new contract for the following season is usually negotiated in August. Address Purchasing Agent, Standard Oil Cloth Co., Rock Island, Ill. (No. 992, Vol. 8, pp. 76, 158, 285).

2300—Philadelphia, Penn.—The Philadelphia Fire Brick Works will soon contract for its annual supply of gas coal, involving approximately 2,000 tons, the contract becoming effective Apr. 1. Address Purchasing Agent, Philadelphia Fire Brick Works, 2306 Vine St., Philadelphia, Penn.

2301—Chicago, Ill.—E. J. Brach & Sons will contract about Apr. 1 for their annual fuel supply, involving approximately 1½ cars of Illinois washed nut coal per week. Address Pur. Agt. Dickens, E. J. Brach & Sons, 543 N. Franklin St., Chicago, Ill.

2302—Vineland, N. J.—The Keighly Shoe Manufacturing Co. contracts for its annual fuel supply on Apr. 1. It is understood the company uses Miller vein coal, for which they pay about $1.40. Address Purchasing Agent, Keighly Shoe Manufacturing Co., Vineland, N. J.

2303—Vineland, N. J.—The G. Chandler Shoe Manufacturing Co. contracts for its annual fuel requirements, involving about 1,000 tons, on Apr. 1. It is understood the company pays about $1.45 per ton. Address Purchasing Agent, The G. Chandler Shoe Manufacturing Co., Vineland, N. J.

2304—Vineland, N. J.—The Kimball Durand Glass Co. contracts for its annual fuel requirements on Apr. 1. The company uses bituminous gas coal, and it is understood the Berwind-White Coal Mining Co. have the present contract. Address Purchasing Agent, Kimball Durand Co., Vineland, N. J.

2305—Chicago, Ill.—The Omaha Packing Co. will be in the market on Mar. 1 for its annual fuel supply, involving approximately 30,000 tons of Illinois screenings. Address Pur. Agt. Newton, Omaha Packing Co., 2320 S. Halsted St., Chicago, Ill.

2306—West Chester, Penn.—The Sharples Separator Co. contracts for its annual fuel requirements on Apr. 1, deliveries being made by Pennsylvania R.R. Address Purchasing Agent, Sharples Separator Co., West Chester, Penn.

2307—Woodstown, N. J.—The Woodstown Ice and Cold Storage Co. will contract for its annual requirements of bituminous coal, involving approximately 1,500 tons, on Apr. 1. Address Pur. Agt. C. F. Moore, Woodstown Ice and Cold Storage Co., Woodstown, N. J.

2308—Chicago, Ill.—The Indiana Quarries Co. will contract for its annual fuel requirements, involving approximately 25,000 tons of Indiana mine-run coal, about Mar. 1. Address Pur. Agt., Indiana Quarries Co., 112 W. Adams St., Chicago, Ill.

2309—Philadelphia, Penn.—The John J. Felin Co. usually contract for its annual fuel requirements, involving approximately 2,500 tons of bituminous coal, on Apr. 1. Delivery is made by Philadelphia & Reading Ry. Address Pur. Agt. Felin, John J. Felin Co., 4142 Germantown Ave., Philadelphia, Penn.

2310—Wilmington, Del.—The Wilson Line contracts for its annual fuel supply on Apr. 1. Address Capt. Wilson, The Wilson Line, Wilmington, Del.

2311—Chicago, Ill.—The Union Wire Mattress Co. is now receiving bids on its annual fuel contract, involving one car of Indiana screenings per week. Address Purchasing Agent, The Union Wire Mattress Co., Blackhawk and Cherry Sts., Chicago, Ill.

2312—Burnham, Penn.—The Logan Iron and Steel Co. contracts for its annual fuel supply on Apr. 1. Deliveries are made by Pennsylvania R.R. Address Purchasing Agent, The Logan Iron and Steel Co., Burnham, Penn.

2313—Beverly, N. J.—The Beverly Underwear Co. contracts for its annual fuel supply, involving about 1,200 tons, on Apr. 1. Deliveries are made by Pennsylvania R.R. Address Pur. Agt. Alban Spooner, The Beverly Underwear Co., Beverly, N. J.

2314—Bloomfield, N. J.—The Westinghouse Lamp Co. contracts for its annual fuel supply on Apr. 1. Address Purchasing Agent, The Westinghouse Lamp Co., Bloomfield, N. J.

2315—Chicago, Ill.—The Independent Pneumatic Tool Co. is now in the market for the annual fuel supply for its Indiana plant, involving approximately 400 tons of Illinois screenings per month. Address Purchasing Agent, Independent Pneumatic Tool Co., 1307 Michigan Ave., Chicago, Ill.

2316—Bridgeton, N. J.—The Arctic Ice and Milk Co. contracts for its fuel supply on Apr. 1. Address Pur. Agt. Sharp, The Arctic Ice and Milk Co., Bridgeton, N. J.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1621—Columbus, Ohio—This contract (Vol. 8, p. 787), which provides for furnishing the Ruggery Building with approximately 300 tons of nut, pea and slack or coarse slack coal, has been awarded to **Homer C. Gill** on Hocking coal at $1.75 per ton delivered, and to the **Hocking Valley Products Co.,** at $2.15 per ton for Hocking mine-run coal delivered. The contract will be divided equally between these two companies. Address Supt. J. W. Lehman, 60 Ruggery Bldg., Columbus, Ohio.

1887——Philadelphia, Penn.—This contract (p. 107), calling for annual requirements of 2,500 tons of broken and pea coal for the Philadelphia Hardware and Malleable Iron Works, has been awarded to the **Philadelphia & Reading Coal and Iron Co.** for the first three months of the present year. Address Treasurer, Philadelphia Hardware and Malleable Iron Works, 9th and Jefferson St., Philadelphia, Penn.

1902—New Castle, Del.—This contract (p. 108), covering an annual tonnage of 3,500 tons of buckwheat coal for the Bethlehem Steel Co., projectile plant, has been awarded to the **Philadelphia & Reading Coal and Iron Co.** for the first quarter of this year. Address Purchasing Agent, Bethlehem Steel Co., South Bethlehem, Penn.

1905—Philadelphia, Penn.—This contract (p. 108) involving a yearly tonnage of 1,000 tons of pea and buckwheat coal for the Pennsylvania Warehousing and Safe Deposit Co. has been taken by the **Philadelphia & Reading Coal and Iron Co.** for the months of January, February and March. Address Treasurer, Pennsylvania Warehousing and Safe Deposit Co., 113 So. Third St., Philadelphia, Penn.

1911—Philadelphia, Penn.—This contract (p. 108), covering yearly tonnage of 1,500 tons of buckwheat for the Orthopædic Hospital, has been taken by the **Philadelphia & Reading Coal and Iron Co.** for the first quarter of the present year. Address Purchasing Agent, Orthopædic Hospital, 17th and Summer St., Philadelphia, Penn.

1918—Wilmington, Del.—This contract (Vol. 9, p. 108), calling for requirements of broken coal for the Wilmington Gas Co., has been awarded to the **Philadelphia & Reading Coal and Iron Co.** for the quarter ending Mar. 31, 1916. Address General Manager, Wilmington Gas Co., Wilmington, Del.

1919—Philadelphia, Penn.—This contract (p. 108), covering annual requirements of 1,000 tons of pea coal for the Philadelphia Lawn Mower Co. has been awarded to the **Philadelphia & Reading Coal and Iron Co.,** for the period ending Mar. 31, 1916. Address President, Philadelphia Lawn Mower Co., 31st and Chestnut St., Philadelphia, Penn.

1937—Columbus, Ohio—The portion of this contract (pp. 149, 361), providing for furnishing the Scioto River Pumping Station with 5,280 tons of West Virginia mine-run coal, has been awarded to the **Banner Coal and Coke Co.** at $1.82 per ton. Address Dir. B. L. Bargar, Purchasing Board, Columbus, Ohio. (No. 65, Vol. 7, pp. 231, 358.)

1946—Columbus, Ohio—Awards have been made on this contract (p. 150), as follows: **Rapp & Co.,** 500 tons of Hocking lump, to be delivered at the City Work House and City Prison at $2.55 per ton, and 300 tons of the same to be delivered at the various engine houses at $2.85 per ton. Address Dir. of Pub. Ser. B. L. Bargar, City Hall, Columbus, Ohio. (No. 1125, Vol. 8, pp. 158, 283, 490.)

1951—Philadelphia, Penn.—This contract (p. 150), calling for annual requirements of 1,000 tons of Lykens Valley buckwheat coal for the Women's Homœopathic Hospital, has been awarded to the **Philadelphia & Reading Coal and Iron Co.** for the first three months of 1916. Address Women's Homœopathic Hospital, 20th St. and Susquehanna Ave., Philadelphia, Penn.

1989—Philadelphia, Penn.—This contract (pp. 193, 233), which provides for furnishing the city government with a reserve supply of coal, has been awarded to the **Emmons Coal Mining Co.** at a gross consideration of $128,000. Other contracts involving $11,000 for the Bureau of Charities and $3,570 for Department of Corrections, were also approved and awarded. Address Dir. Joseph S. McLaughlin, Dept. of Supplies, City Hall, Philadelphia, Penn. (No. 1835, Vol. 8, p. 1089; Vol. 9, pp. 36, 106, 148.)

2049—Batavia, Ohio—This contract (p. 278), which provides for furnishing the fuel requirements of the local power plants during the ensuing year, has been awarded to **G. A. Keen & Bro.** at $2.35 per ton, delivered at the power plant. The contract is to run only until Apr. 1 of the current year. Address Supt. N. B. Dennison, Water and Light Dept., Batavia, Ohio (Vol. 7, p. 628).

Financial Department

Maritime Coal, Railway & Power Co., Ltd.

This company reports for the year ended Feb. 28, in part, as follows:

The gross profits increased $5,513, and after providing for the usual amount for depreciation on mining rights the net profit amounted to $111,211, an increase of $20,076, being equal to 22 per cent. Out of the profits carried forward from last year we have transferred to general reserve $35,000, and we have increased the depreciation and renewal reverse by $3,000, these two accounts being now $35,000 and $30,000, respectively, leaving a balance of $52,757, which, added to the net profit for this year, gives the sum of $163,968. Out of this sum we have paid interest on bonds amounting to $93,602; we have transferred to our sinking-fund reserve $3,842; we have written $7,870 off the discount on securities account and we have written $5,000 off our coal stock to provide for possible depreciation thereon, and we have carried forward $53,654 at credit of profit and loss.

The installation of the electrical coal-mining equipment at the Joggins Colliery was proceeded with during the year and we believe that we have now at Joggins one of the best equipped mines in Canada. Development work was actively continued and had it not been for the unfortunate industrial conditions precipitated by the outbreak of war on Aug. 1 last, our coal output would have shown a very substantial increase. As it was, only working four days per week the greater part of the year, we were able to maintain our output to within 8 per cent. of that of last year; working full time we could procure 50 per cent. more than our present output and special efforts are constantly being directed to enlarging our markets.

INCOME ACCOUNT FOR YEARS ENDING FEBRUARY 28

	1914-15	1913-14	1912-13
Gross profits	$122,473	$116,960	$100,361
Discount, etc., written off	7,870	7,161	9,553
Depreciation	6,416	6,047	6,091
Miscellaneous	9,846	12,617	14,326
Bond interest	93,602	75,120	56,045
Sinking fund	3,842	4,289	3,999
Balance, surplus	$897	$11,726	$10,347

BALANCE SHEET FEBRUARY 28

Assets	1915	1914	Liabilities	1915	1914
Property*	$3,416,951	$3,479,758	Common stock	$2,000,000	$2,000,000
Investments (cost)	56,500	56,500	Preferred stock	16,500	.....
Book debts	132,075	70,045	First mtge. bonds	1,595,000	1,447,000
Stocks at stores	9,423	7,977	Bills payable	.....	25,000
Mining supplies	18,809	12,618	Accounts payable	25,832	34,533
Coal on hand	10,432	11,703	Accrued bond int.	30,608	36,771
Cash	26,838	52,771	Depreciation reserve	38,949	34,532
Unexpired insur.	4,803	1,392	Other reserves	36,800	.....
Discount on securities	149,526	.....	Sinking fund	28,014	24,171
			Surplus	53,654	90,757
Total	$3,825,357	$3,692,764	Total	$3,825,357	$3,692,764

* Property includes mining rights, development, electric-power plant, real estate, maritime railway and equipment. There is also a contingent liability on bills discounted, $8,607.

St. Louis, Rocky Mountain & Pacific Co.

This company reports, in part, for the year ended June 30, 1915, as follows:

Coal and Coke—The sale of the railway has been accomplished, and hereafter your company's activities will be strictly confined to the mining and sale of coal and its products.

The coal production for the fiscal year of each of our mines was as follows: Gardiner, 172,634 tons; Koehler, 583,598; Brilliant, 160,703; Sugarite, 163,170; Van Houten, 564,117; total tons, 1,644,222. The coke production was as follows: Koehler, 210 ovens, 8,714 tons; Gardiner, 200 ovens, 69,667 tons; total, 78,381 tons.

The coal and coke demand has been only fairly satisfactory, but just at present the situation in Mexico, which has been in such an unsatsifactory state for so many years, shows some improvement. The demand for coke for copper smelters has also shown such an increase that the company has felt warranted in firing up all of its coke ovens, most of which had been idle since August, 1914. Prospects for development of our markets, halted by temporary disturbances in Mexico, the financial uncertainty caused by war conditions, and oil development in adjoining states are now more promising.

Our power plants are now held for emergency purposes, all power used being received from the plants of the Trinidad Electric Transmission, Railway and Gas Co. The sum of $126,514 was expended for additions and betterments out of current funds.

Dividends—The regular quarterly dividends of 1¼ per cent. were paid on the preferred stock, while ½ of 1 per cent. semi-annual dividends were paid on the common stock.

[Rees H. Beddow, State Mine Inspector, Gallup, N. M., Aug. 25, 1915, wrote: "I have no hesitancy in stating that the mines of this company will compare favorably with the best mines in this country, when the method of mining, the system of ventilation, the application of electrical equipment and the regulations for safety are taken into consideration."]

INCOME ACCOUNT FOR YEARS ENDING JUNE 30

	1914-15	1913-14	1912-13	1911-12
Coal mined (tons)	1,644,222	( )	1,326,521	1,167,985
Coke produced (tons)	78,381	( )	153,510	69,655
Coal and coke sales	2,465,215	2,276,868	2,141,913	1,812,573
Cost, expenses, tax., etc.	1,815,208	1,688,661	1,621,999	1,304,819
Net earnings	$650,007	$643,207	$519,914	$507,754
Other income	207,752	180,310	97,571	98,385
Total net income	$857,759	$823,517	$617,485	$606,089
Interest charges, etc.	$414,004	$486,894	$385,956	$388,368
Deprec'n reserve, etc.	111,564	107,443	113,294	101,700
Pref. dividends (5%)	50,000	50,000	50,000	.....
Common dividends (1%)	100,000	100,000	.....	.....
Surplus	$182,191	$79,180	$68,235	$116,021

Note—For previous annual report of this company see Vol. 8, p. 282.

George B. Newton Coal Co.

President Samuel B. Crowell says in the report for the year ended Oct. 31, 1915, that during the year the company handled a total tonnage of 936,404 tons. The decrease was due to the general business depression and in part to the fact that the company was underbid in 60,000 tons of coal for the city.

The expense in handling the business was $936,363, against a cost of $1,006,576 in handling the business of 1,312,850 tons in the 1914 fiscal year. Trade improvement is noted for October and November. A building-material line has been added to the company's business.

The George B. Newton Coal Co., including B. Rowland & Bro., Inc., balance sheet as of Oct. 31, 1915, is as follows:

Assets		Liabilities	
Real estate	$712,411	Bonds (5%)	$222,000
Buildings and improve.	415,332	Mortgage	20,000
Mach. tools and scales	142,879	Bills payable	290,000
Horses, wagons, etc	428,852	Accts. payable	566,819
Furniture and fixtures	35,392	Accrued charges	13,245
Inv., feed, supplies, etc	23,037	Res. for bad debts	14,544
Deferred charges	27,665	First preferred stock	1,750,000
In'ments of coal and wood	474,536	Second preferred stock	1,710,000
Accounts receivable	727,068	Common stock	1,750,000
Bills receivable	19,897	Sinking fund	95,259
Cash	72,651	Undistributed profits	28,382
Investments	47,580		
Goodwill	2,345,000		
Trade agreements	822,300		
Organization expenses	54,734		
Invest. of sink. fund	100,659		
Total	$6,460,251	Total	$6,460,251

Note—For previous annual report of this company see Vol. 8, p. 1040.

J. B. B. Coal Co.—For the year the output of this company (60% of whose capital stock is owned by New England Coal & Coke Co.) was 414,345 gross tons, an increase of 68,039 tons. Recent tests and increased sales of J. B. B. Pocahontas coal give proof of its merits as a high-grade smokeless coal. For the year the company shows net surplus available for dividends of $36,001, a decrease of $18,548.